SEQUENCE LISTING

<110> Bryan, Gregory Thomas
       Johnson, Richard
       Scott, Barry
       Young, Carolyn A.
       Tapper, Brian Anthony
       Parker, Emily Jane

<120> INDOLE-DITERPENE BIOSYNTHESIS

<130> JAMES68.016APC

<140> US 10/584,429
<141> 2006-06-22

<150> PCT/NZ2004/000333
<151> 2004-12-22

<150> NZ 530331
<151> 2003-12-22

<160> 55

<170> PatentIn version 3.3

<210> 1
<211> 1110
<212> DNA
<213> Neotyphodium lolii

<400> 1

```
atgacgatgg ctgccaatga ctttccattt caatgccagg agaagaaatc atattctcag      60

ccaagtctag tctactgcaa tggtaacatt gcggagacgt atctcgaaga aaaggtattt     120

atactgctcc tttataatct cgaatgccac ttaaaattta gacaggtttt gacagcgccg     180

ttggattatt tgcgtgcctt acctagcaaa gatattcgca gtggactgac cgacgccatt     240

aatgagttcc tgcgtgtccc agaggaaaag gttcttgtca taaagcgtat aattgatctt     300

cttcacaatg catccttact gtaagttcga gattgcataa catagaccta gtagattcta     360

actaacagct ttagcattga tgatatccag gattcatcca aactgcgacg tggagtccct     420

gtagcccacc acatatttgg aatcgcacaa acaataaatt cggccaatct agcgtatttc     480

attgcccaga gagagcttga gaagcttacg aatcctcgag catttgctat atataatgag     540

gagctaatca atctgcatcg tggtcagggt atggagctcc attggagaga atcgctccat     600

tgccctaccg aagatgagta tctgcgaatg atccaaaaga agacaggcgg tctgttccga     660

ttggcaatca gactgctgca aggcgaaagc gctagcgatg acgattatgt ctcacttatt     720

gatactctcg gaaccctgtt ccagattcga gatgactatc aaaacttaca gagtgatata     780

tattctaaga acaaaggcta ctgtgaggat ttaacagagg gcaaattctc gtatccggtc     840

atccatagta ttcggtcgcg accaggagat gttcgattaa tcaatatttt gaaacagcgt     900

agtgaagatg ttatggtgaa gcaatacgcg gtgcaacata tcgaatctac aggaagcttc     960
```

gcattctgtc aaaataaaat tcaatctttg gtggagcaag caagagagca attggcggct   1020

ctagaaaata gcagttcatg tggaggcccc gttcgcgaca tccttgacaa gttagcaata   1080

aaaccacggg caaatataga agtagagtag   1110

<210> 2
<211> 334
<212> PRT
<213> Neotyphodium lolii

<400> 2

Met Thr Met Ala Ala Asn Asp Phe Pro Phe Gln Cys Gln Glu Lys Lys
1   5   10   15

Ser Tyr Ser Gln Pro Ser Leu Val Tyr Cys Asn Gly Asn Ile Ala Glu
            20   25   30

Thr Tyr Leu Glu Glu Lys Val Leu Thr Ala Pro Leu Asp Tyr Leu Arg
        35   40   45

Ala Leu Pro Ser Lys Asp Ile Arg Ser Gly Leu Thr Asp Ala Ile Asn
    50   55   60

Glu Phe Leu Arg Val Pro Glu Glu Lys Val Leu Val Ile Lys Arg Ile
65   70   75   80

Ile Asp Leu Leu His Asn Ala Ser Leu Leu Ile Asp Asp Ile Gln Asp
            85   90   95

Ser Ser Lys Leu Arg Arg Gly Val Pro Val Ala His His Ile Phe Gly
            100   105   110

Ile Ala Gln Thr Ile Asn Ser Ala Asn Leu Ala Tyr Phe Ile Ala Gln
        115   120   125

Arg Glu Leu Glu Lys Leu Thr Asn Pro Arg Ala Phe Ala Ile Tyr Asn
    130   135   140

Glu Glu Leu Ile Asn Leu His Arg Gly Gln Gly Met Glu Leu His Trp
145   150   155   160

Arg Glu Ser Leu His Cys Pro Thr Glu Asp Glu Tyr Leu Arg Met Ile
            165   170   175

Gln Lys Lys Thr Gly Gly Leu Phe Arg Leu Ala Ile Arg Leu Leu Gln
            180   185   190

```
Gly Glu Ser Ala Ser Asp Asp Asp Tyr Val Ser Leu Ile Asp Thr Leu
        195             200                 205


Gly Thr Leu Phe Gln Ile Arg Asp Asp Tyr Gln Asn Leu Gln Ser Asp
        210             215             220


Ile Tyr Ser Lys Asn Lys Gly Tyr Cys Glu Asp Leu Thr Glu Gly Lys
225             230             235                     240


Phe Ser Tyr Pro Val Ile His Ser Ile Arg Ser Arg Pro Gly Asp Val
                245             250                 255


Arg Leu Ile Asn Ile Leu Lys Gln Arg Ser Glu Asp Val Met Val Lys
            260             265             270


Gln Tyr Ala Val Gln His Ile Glu Ser Thr Gly Ser Phe Ala Phe Cys
        275             280             285


Gln Asn Lys Ile Gln Ser Leu Val Glu Gln Ala Arg Glu Gln Leu Ala
        290             295             300


Ala Leu Glu Asn Ser Ser Ser Cys Gly Gly Pro Val Arg Asp Ile Leu
305             310             315                     320


Asp Lys Leu Ala Ile Lys Pro Arg Ala Asn Ile Glu Val Glu
                325             330
```

<210> 3
<211> 1647
<212> DNA
<213> Neotyphodium lolii

<400> 3

```
atgactagcg acttcaaggt aataatcgtg ggaggatcag tggctgggct ttcactagcc    60

cactgcttag aaaaaatcgg tgtttctttc atggttctag agaagggtaa tcaaatagct   120

ccccaactcg gtgcctcaat tggcattttg ccaaatggtg gacgtattct tgatcaactg   180

ggcatcttcc atagcatcga ggatgaaatc gaacctctag aatctgctat gatgagatac   240

ccggatggtt tctctttcaa aagtcaatat ccccaagctt tgcatactag gtaataacag   300

tgaaagaaga gtggcctata agtgttcata tatcgctaac ttcgtgcggt taatagtttt   360

ggttatcccg tggctttcct tgagaggcaa aggtttcttc agatacttta tgataaactc   420

aagagcaaag actgcgtttt tacaaacaag cgggtagtca gtattgcaag tggccaagac   480

aaagtcacag caaagacttc agatggcgct aagtacttag cagatatcgt gatcggtgct   540

gacggggtcc acagcatcgt caggtcagag atttggaggc atttgaagga aaactctcaa   600

atatcagtat tagaggcacc gaacgcaagt aggttaacct aggattaatt gcaaagaaac   660
```

```
tttactaatg agggagccac ttaggtatta agcatgatta ttcatgcatt tacggaattt   720

ctttaaacgt tccccagatc atcctaggaa tacagttaaa ctgtttagat gacggagtgt   780

caatacactt gtttacgggt aaacaatcca aattattttg gtttgttatc atcaaaacgc   840

ctcaggctag ctttgctaaa gtagagattg acaatacaca tacagcaagg tgtatctgcg   900

aaggactgag gacgaaaaag gtttcagata ccttatgttt tgaagatgta tggtcaagat   960

gcaccatatt caagatgacg cctcttgagg aaggggtgtt taagcattgg aactatggcc  1020

gcttagcatg tattggtgat gctatccgca aggtatgtgg atgatgctat atgtccctat  1080

ttcgtgtcat cagtgggatg acaaaagaag gccactattt gccgctaata taaatgatcg  1140

tatcgctaac attaacagat ggccccaaat aatgggcaag gagcaaatat ggcgatagag  1200

gacgcttgca gtctcgcaaa catcctccag aaaaagatat cacatggttc gattcgagac  1260

caagatatca attcaatgtt tcaggaattc tctatggctc aacgggctcg cacggagagc  1320

gtctgcgcgc agtcggagtt tctagtccgc atgcatgcga atcaaggtat tggaagaaga  1380

cttcttgggc ggtaccttat tcctttcctg tatgacgcac ctgctggttt atctggattt  1440

tctataagtg gcgcaacaag aatagagttc atagacttgc ccactagatc tcttagggga  1500

gcgtgggggaa agtcatggag agggtcatgg gaattcatcc tacaaagctt ggtctatttg  1560

cgacccaagt ttaggatagt ttatgccttg tatctcgttg cagctgcagc ttttatcttg  1620

tattgtctta gcagtctctt cccgtag                                       1647
```

```
<210>  4
<211>  472
<212>  PRT
<213>  Neotyphodium lolii

<400>  4

Met Thr Ser Asp Phe Lys Val Ile Ile Val Gly Gly Ser Val Ala Gly
1               5                   10                  15


Leu Ser Leu Ala His Cys Leu Glu Lys Ile Gly Val Ser Phe Met Val
            20                  25                  30


Leu Glu Lys Gly Asn Gln Ile Ala Pro Gln Leu Gly Ala Ser Ile Gly
        35                  40                  45


Ile Leu Pro Asn Gly Gly Arg Ile Leu Asp Gln Leu Gly Ile Phe His
    50                  55                  60


Ser Ile Glu Asp Glu Ile Glu Pro Leu Glu Ser Ala Met Met Arg Tyr
65                  70                  75                  80
```

Pro Asp Gly Phe Ser Phe Lys Ser Gln Tyr Pro Gln Ala Leu His Thr
                85   90   95

Ser Phe Gly Tyr Pro Val Ala Phe Leu Glu Arg Gln Arg Phe Leu Gln
            100   105   110

Ile Leu Tyr Asp Lys Leu Lys Ser Lys Asp Cys Val Phe Thr Asn Lys
        115   120   125

Arg Val Val Ser Ile Ala Ser Gly Gln Asp Lys Val Thr Ala Lys Thr
    130   135   140

Ser Asp Gly Ala Lys Tyr Leu Ala Asp Ile Val Ile Gly Ala Asp Gly
145   150   155   160

Val His Ser Ile Val Arg Ser Glu Ile Trp Arg His Leu Lys Glu Asn
            165   170   175

Ser Gln Ile Ser Val Leu Glu Ala Pro Asn Ala Ser Ile Lys His Asp
            180   185   190

Tyr Ser Cys Ile Tyr Gly Ile Ser Leu Asn Val Pro Gln Ile Ile Leu
        195   200   205

Gly Ile Gln Leu Asn Cys Leu Asp Asp Gly Val Ser Ile His Leu Phe
    210   215   220

Thr Gly Lys Gln Ser Lys Leu Phe Trp Phe Val Ile Ile Lys Thr Pro
225   230   235   240

Gln Ala Ser Phe Ala Lys Val Glu Ile Asp Asn Thr His Thr Ala Arg
            245   250   255

Cys Ile Cys Glu Gly Leu Arg Thr Lys Lys Val Ser Asp Thr Leu Cys
            260   265   270

Phe Glu Asp Val Trp Ser Arg Cys Thr Ile Phe Lys Met Thr Pro Leu
        275   280   285

Glu Glu Gly Val Phe Lys His Trp Asn Tyr Gly Arg Leu Ala Cys Ile
    290   295   300

Gly Asp Ala Ile Arg Lys Met Ala Pro Asn Asn Gly Gln Gly Ala Asn
305   310   315   320

Met Ala Ile Glu Asp Ala Cys Ser Leu Ala Asn Ile Leu Gln Lys Lys
            325   330   335

Page 5

```
Ile Ser His Gly Ser Ile Arg Asp Gln Asp Ile Asn Ser Met Phe Gln
        340             345             350

Glu Phe Ser Met Ala Gln Arg Ala Arg Thr Glu Ser Val Cys Ala Gln
        355             360             365

Ser Glu Phe Leu Val Arg Met His Ala Asn Gln Gly Ile Gly Arg Arg
    370             375             380

Leu Leu Gly Arg Tyr Leu Ile Pro Phe Leu Tyr Asp Ala Pro Ala Gly
385             390             395             400

Leu Ser Gly Phe Ser Ile Ser Gly Ala Thr Arg Ile Glu Phe Ile Asp
            405             410             415

Leu Pro Thr Arg Ser Leu Arg Gly Ala Trp Gly Lys Ser Trp Arg Gly
        420             425             430

Ser Trp Glu Phe Ile Leu Gln Ser Leu Val Tyr Leu Arg Pro Lys Phe
        435             440             445

Arg Ile Val Tyr Ala Leu Tyr Leu Val Ala Ala Ala Ala Phe Ile Leu
    450             455             460

Tyr Cys Leu Ser Ser Leu Phe Pro
465             470
```

```
<210>  5
<211>  2063
<212>  DNA
<213>  Neotyphodium lolii

<400>  5
atgcaatacg gtaatttaac aactgtatta cttctgcgta atactttatt gtccttgaat    60

tcttcgtcaa tctgccatgt tcactggctg caagtgattg tggctctgct tgtcttgatc   120

gtctgcatct ttctatattg gcgaacaccc actggcatca atgctccttt cgcaggatat   180

cgttcaccat gggagccgcc gctcttggtt cagatgcgtt acgtcttcaa cgctgcctca   240

atgatacgcg aaggatatgc taaggtatgt tttatcccgc gtagaggtct tctacccgga   300

tagaccgaga agataacaac ttcggaacag tggaaagact ccttgttcca gatctcacga   360

tacgacggtg acattcttat tgtgcctcca agatatttgg atgacctcca caacaagtca   420

caagaggagt taagtgctat ttatggtttg attcgggtga ggaatgccac caaccaaaaa   480

acgcagagcc tattagcgca tggtctcaca tattcgaatt tgctagaatt ttggtggtag   540

ctatagcggc atcaccctgc ttggagaaaa cgatgttggc attcgtgcgc ttcaggtatg   600
```

```
tacacccttc caaaagtctg ttagggacct tccttactct actacagaca aaaatcaccc    660

caaatcttgc gaaattatgc gatgacataa gggatgagtt tcagtattgt ctagatacag    720

acttcccagc ctgcagaggt atgccatttc caaaatccca ttatgcagtc tctacttttt    780

ctggcactaa cgatatctaa catagattgg acatcagtgt ccgtgcatcc attgtttcta    840

aaagcagtcg aaaggataac acatcggatt tttgttggat tgccattatg tcggaatccc    900

caatgggtcc aagcgaccag caagcatgca cattacggta cgtcaattga ctaataatag    960

gcaatatacg cgctcatatg ctttgcagca acaatgatac agatagctat gagatctgtc    1020

ccaaagttca ttcagccttt actaaatttt tgccttccgt ggccatggaa gaacgcagcc    1080

tgtgttcgtg aagcaaagaa tgcccttata ttagaaatgc aacgccgacg aaatctcgag    1140

aaagttaaca gttttgatta tatcaaatcc aatgacttgc tgcaagcagt tatggaaatg    1200

tcttctccta gtcatgagga tagccagctt gatgttgtcg cccagataat gctcacgatg    1260

aacacaatcg ctggccacag tactgccgca tccggagcac atgcactgtt cgatatggtt    1320

agccactcta agtatattga attgctgcgt gaggaggctc ttcaagtctt tcgacatgtt    1380

gaactgcgtg ttacaaaaca ggctttgggg gatttgcgaa aattggacag cttcctcaga    1440

gagttagtat tgtcctaaac atcacaatct caccacattc tcacgctagc ttttcctccg    1500

tactaatgat ggtcgttgct aagatcccaa cgacataatc cgctaagctt gtgtatgttt    1560

agctaagagt ctcgaaaacc tggaaatgtt tgtcctgtgc ccgagttcta acgtctctta    1620

ctacagtagg cttttttcgg gtcgtattag accctgccgg tatcacactt caagatggca    1680

cacatgttcc ttacaacaca ctgctttgtg tcgcaccaca tgcgatatcc aatgacccgg    1740

atgtgataga agacccaacc tcgttcaacg gtctgcgata ctacgaacag cgctgtcgtg    1800

acgccagtca agagaaaaag catcaatacg ctactacgga taaatctcac ctgcattttg    1860

gctacggaac ctgggcctgt ccaggccgct tcttggcctc tgatatgtta aaagtgattc    1920

taacgatgct tctgcttcag tatgacatcc gctcccccga gagagcaaaa cggcctgtgg    1980

caggtcattt tcatgagttt ccgcttttca atattaacac accactgtta atgaaacgac    2040

gcaatgattc gctagttcta tga                                           2063
```

```
<210>   6
<211>   533
<212>   PRT
<213>   Neotyphodium lolii

<400>   6
```

```
Met Gln Tyr Gly Asn Leu Thr Thr Val Leu Leu Leu Arg Asn Thr Leu
1               5                   10                  15


Leu Ser Leu Asn Ser Ser Ser Ile Cys His Val His Trp Leu Gln Val
```

Ile Val Ala Leu Leu Val Leu Ile Val Cys Ile Phe Leu Tyr Trp Arg
        35   40   45

Thr Pro Thr Gly Ile Asn Ala Pro Phe Ala Gly Tyr Arg Ser Pro Trp
    50   55   60

Glu Pro Pro Leu Leu Val Gln Met Arg Tyr Val Phe Asn Ala Ala Ser
65   70   75   80

Met Ile Arg Glu Gly Tyr Ala Lys Trp Lys Asp Ser Leu Phe Gln Ile
            85   90   95

Ser Arg Tyr Asp Gly Asp Ile Leu Ile Val Pro Pro Arg Tyr Leu Asp
            100   105   110

Asp Leu His Asn Lys Ser Gln Glu Glu Leu Ser Ala Ile Tyr Gly Leu
        115   120   125

Ile Arg Asn Phe Gly Gly Ser Tyr Ser Gly Ile Thr Leu Leu Gly Glu
    130   135   140

Asn Asp Val Gly Ile Arg Ala Leu Gln Thr Lys Ile Thr Pro Asn Leu
145   150   155   160

Ala Lys Leu Cys Asp Asp Ile Arg Asp Glu Phe Gln Tyr Cys Leu Asp
            165   170   175

Thr Asp Phe Pro Ala Cys Arg Asp Trp Thr Ser Val Ser Val His Pro
            180   185   190

Leu Phe Leu Lys Ala Val Glu Arg Ile Thr His Arg Ile Phe Val Gly
    195   200   205

Leu Pro Leu Cys Arg Asn Pro Gln Trp Val Gln Ala Thr Ser Lys His
    210   215   220

Ala His Tyr Ala Thr Met Ile Gln Ile Ala Met Arg Ser Val Pro Lys
225   230   235   240

Phe Ile Gln Pro Leu Leu Asn Phe Cys Leu Pro Trp Pro Trp Lys Asn
            245   250   255

Ala Ala Cys Val Arg Glu Ala Lys Asn Ala Leu Ile Leu Glu Met Gln
            260   265   270

Arg Arg Arg Asn Leu Glu Lys Val Asn Ser Phe Asp Tyr Ile Lys Ser
        275   280   285

Asn Asp Leu Leu Gln Ala Val Met Glu Met Ser Ser Pro Ser His Glu
    290   295   300

Asp Ser Gln Leu Asp Val Val Ala Gln Ile Met Leu Thr Met Asn Thr
305   310   315   320

Ile Ala Gly His Ser Thr Ala Ala Ser Gly Ala His Ala Leu Phe Asp
            325   330   335

Met Val Ser His Ser Lys Tyr Ile Glu Leu Leu Arg Glu Glu Ala Leu
            340   345   350

Gln Val Phe Arg His Val Glu Leu Arg Val Thr Lys Gln Ala Leu Gly
        355   360   365

Asp Leu Arg Lys Leu Asp Ser Phe Leu Arg Glu Ser Gln Arg His Asn
    370   375   380

Pro Leu Ser Leu Leu Gly Phe Phe Arg Val Val Leu Asp Pro Ala Gly
385   390   395   400

Ile Thr Leu Gln Asp Gly Thr His Val Pro Tyr Asn Thr Leu Leu Cys
            405   410   415

Val Ala Pro His Ala Ile Ser Asn Asp Pro Asp Val Ile Glu Asp Pro
            420   425   430

Thr Ser Phe Asn Gly Leu Arg Tyr Tyr Glu Gln Arg Cys Arg Asp Ala
        435   440   445

Ser Gln Glu Lys Lys His Gln Tyr Ala Thr Thr Asp Lys Ser His Leu
    450   455   460

His Phe Gly Tyr Gly Thr Trp Ala Cys Pro Gly Arg Phe Leu Ala Ser
465   470   475   480

Asp Met Leu Lys Val Ile Leu Thr Met Leu Leu Leu Gln Tyr Asp Ile
            485   490   495

Arg Ser Pro Glu Arg Ala Lys Arg Pro Val Ala Gly His Phe His Glu
            500   505   510

Phe Pro Leu Phe Asn Ile Asn Thr Pro Leu Leu Met Lys Arg Arg Asn
        515   520   525

Asp Ser Leu Val Leu
    530

<210> 7
<211> 1115
<212> DNA
<213> Neotyphodium lolii

<400> 7
atgacatctg gagcatggct cgtggctcgc cctgcggcca tcgaaattgc ggccctcttg   60

tttgcattta cgctcgggta tctagtaaag tacacaatca attaccaatc tgtcgtttct   120

caagccattg atcattatgg ctatggctat gaacgtacct ctcacgaagg tattggcggc   180

agcaatggca agattcctga ctgtccatac tcttatgtga ttagtctcta tgggcataat   240

catttctctc ccctcgtgga ttttcttcat ccaacattga aacataaata tcccaagaaa   300

cattctttga tcctggatat catggatgcg gtccatcttt gtctaattat ggttgacgat   360

atttgcgacc acagccctaa gcggaaaaat cacactacgg ctcacttgct atacggatca   420

tgcgaaactg ccaatcgagc atacttcgtt ctcacaaagg tcattaatag agcaatgaaa   480

gaacaacctg tccttggaat tgaacttctg agagcactag aactgatact cgagggacaa   540

gacatgtctt tggtttggcg aagagacggt ttgcgatctt tcgaatccta tggtgaagaa   600

agcctgttga cgtacaaaaa tatggctctg ctgaagacag gcacactttt tgtgctcctt   660

gggaggcttt tgaaccaagg aggtcatcaa tcagacgatc tgttaggccg atttgggtat   720

gtaaattttt ttttttttcg ctcgtttcat aattccgcgg caaggtcgct taactaattc   780

aatggaatgg tagctggtac gcacaattgc aaaatgattg caagaacata tactcagaag   840

agtacgcttt taacaaaggc actgttgcag aagacctacg caacagagaa ttgtcctttc   900

ctgttgtggt tgctcttaat gacaaacata ctgagccgca gataaggaag gcgtttcaga   960

gccaaaatca aggcgacatt aaacgggcac tccaagcgtt agagtcacct agtgttaaaa   1020

acacgtgtct caaaacgctc caggaggcag gtcagggtct agagaacttg gtggccgtct   1080

ggggacgaaa agaacaaatg cactttacaa aatga   1115

<210> 8
<211> 345
<212> PRT
<213> Neotyphodium lolii

<400> 8

Met Thr Ser Gly Ala Trp Leu Val Ala Arg Pro Ala Ala Ile Glu Ile
1   5   10   15

Ala Ala Leu Leu Phe Ala Phe Thr Leu Gly Tyr Leu Val Lys Tyr Thr
            20   25   30

Ile Asn Tyr Gln Ser Val Val Ser Gln Ala Ile Asp His Tyr Gly Tyr
        35   40   45

Gly Tyr Glu Arg Thr Ser His Glu Gly Ile Gly Gly Ser Asn Gly Lys
        50   55   60

Ile Pro Asp Cys Pro Tyr Ser Tyr Val Ile Ser Leu Tyr Gly His Asn
65   70   75   80

His Phe Ser Pro Leu Val Asp Phe Leu His Pro Thr Leu Lys His Lys
                85   90   95

Tyr Pro Lys Lys His Ser Leu Ile Leu Asp Ile Met Asp Ala Val His
                100   105   110

Leu Cys Leu Ile Met Val Asp Asp Ile Cys Asp His Ser Pro Lys Arg
        115   120   125

Lys Asn His Thr Thr Ala His Leu Leu Tyr Gly Ser Cys Glu Thr Ala
    130   135   140

Asn Arg Ala Tyr Phe Val Leu Thr Lys Val Ile Asn Arg Ala Met Lys
145   150   155   160

Glu Gln Pro Val Leu Gly Ile Glu Leu Leu Arg Ala Leu Glu Leu Ile
                165   170   175

Leu Glu Gly Gln Asp Met Ser Leu Val Trp Arg Arg Asp Gly Leu Arg
                180   185   190

Ser Phe Glu Ser Tyr Gly Glu Glu Ser Leu Leu Thr Tyr Lys Asn Met
        195   200   205

Ala Leu Leu Lys Thr Gly Thr Leu Phe Val Leu Leu Gly Arg Leu Leu
    210   215   220

Asn Gln Gly Gly His Gln Ser Asp Asp Leu Leu Gly Arg Phe Gly Trp
225   230   235   240

Tyr Ala Gln Leu Gln Asn Asp Cys Lys Asn Ile Tyr Ser Glu Glu Tyr
            245   250   255

Ala Phe Asn Lys Gly Thr Val Ala Glu Asp Leu Arg Asn Arg Glu Leu
            260   265   270

Ser Phe Pro Val Val Val Ala Leu Asn Asp Lys His Thr Glu Pro Gln
                    Page 11

```
      275                    280                    285
```

```
Ile Arg Lys Ala Phe Gln Ser Gln Asn Gln Gly Asp Ile Lys Arg Ala
    290                    295                    300


Leu Gln Ala Leu Glu Ser Pro Ser Val Lys Asn Thr Cys Leu Lys Thr
305                    310                    315                    320


Leu Gln Glu Ala Gly Gln Gly Leu Glu Asn Leu Val Ala Val Trp Gly
                   325                    330                    335


Arg Lys Glu Gln Met His Phe Thr Lys
                   340                    345
```

```
<210>  9
<211>  1829
<212>  DNA
<213>  Neotyphodium lolii

<400>  9
atgttaatgt tgcacgctgt cccagtgggt atctgtttac tactgtggta cgttgtttac    60

ggtaccaaac ggaaagaatg tataccaacc attcgacgtt ggcctcgatt actcccccaa   120

ttcctcgatc ggctgagtta taatgaccat gccgcccgcc tagtcaaaca tggctatgag   180

aaggtgttcg gtcccaagtc tgtgagcatc cgtgatgata gtactaaccg cctaggttac   240

agcacaaaaa tcaaccgttt aggctactta agatggacat ggatctgatt gtcattcctt   300

tacaatacgc gctggaatta cgggcggtta cgagcgacaa attagaccct ttaacagcca   360

gctttgatga caatgctggt aaagttacga ggatattatt agggagcgaa cttcacacac   420

gtgccataca gcagcgtttg actccaaagc ttcgtaagtg taatctaaca gaatacgttt   480

gcactatgct aactgaatcc agcacaaact cttccagtgc tattggatga gctcaatcat   540

gcctttgggc aagtcttacc tgccggcaac gacggtatgt gttttcattc tttcaaacat   600

tccacttgtc tagtgttgtc taatattagt ggaggttcca atgcttggat ttctgtcaat   660

ccatacgaat tggttctcaa tctagctacc cgtgctacag cgaggctatt cgttggagac   720

ctgatttgtc gaaacgaaat ttttctcgag actactgctt cttttagtcg caacacgttt   780

gatacgatat ccacctcccg tagttttggc aatttgttca cacattattt cgcacggtgg   840

atttccacag cgaaagaagc tcacgggcaa ttacaataca ttcaaaacct ccttggttca   900

gaagtccaga gaaggaaact taactctgag gaaaagcacg acgacttttt gcagtggtgt   960

acagagttag cagtcaccga ggatgaagca cggccagaag cacttgcgca tcgtacgcta  1020

ggaatattga gcatggctgt cattcataca acagctatgg cgttaactca catacttttt  1080

gacatgatct cggacgacag cttgaaggag agcctccgaa gagaacagca aaacgtgctc  1140
```

```
aagcatggtt ggacggaaat cacgcaacag actatgcttg atatgaaaca attggatagc   1200

ctgatgagag agtcacaacg aatcaatcca gtgggcgagt gtaaggacta ttctaagcca   1260

gtcttttgtc aaacttggaa ctaactggcg attgaagtca cttttagacg cattgtccga   1320

gaacgaatta cattgtccga tggctaccag ctacagccgg gacagcagat tgcgattcca   1380

gcgaagtgta tcaatacgga cagtacgaaa ttatccgacg ctcacttgtt tcaacctttt   1440

cgatggttga aacaatctgg cactgccaca acatcatttt ctaacagcag cgccttgaat   1500

ctgcacttcg gatttgggag atatgcctgt ccgggacgct tcatagcttc cgtatgtgat   1560

gtagattttc atcttttttt tttccatatc aatctccctt caagctcatg tgacgcacat   1620

tcgaccttct tgactaaccc ttgagtttgt gctcatagta tatgattaaa gcaatcatga   1680

gtcggattct gctcgagtat gattttaagc tagatagtga gtttccgtcg cggcgccctc   1740

ctaacattgt tcatggggat aagatcctcc ccaatcggaa tgccgttgtt cttttgcgcc   1800

gcttggagaa gacagttacc gtatgttga                                     1829
```

<210> 10
<211> 498
<212> PRT
<213> Neotyphodium lolii

<400> 10

```
Met Leu Met Leu His Ala Val Pro Val Gly Ile Cys Leu Leu Leu Trp
1               5                   10                  15


Tyr Val Val Tyr Gly Thr Lys Arg Lys Glu Cys Ile Pro Thr Ile Arg
                20                  25                  30


Arg Trp Pro Arg Leu Leu Pro Gln Phe Leu Asp Arg Leu Ser Tyr Asn
            35                  40                  45


Asp His Ala Ala Arg Leu Val Lys His Gly Tyr Glu Lys His Lys Asn
        50                  55                  60


Gln Pro Phe Arg Leu Leu Lys Met Asp Met Asp Leu Ile Val Ile Pro
65                  70                  75                  80


Leu Gln Tyr Ala Leu Glu Leu Arg Ala Val Thr Ser Asp Lys Leu Asp
                85                  90                  95


Pro Leu Thr Ala Ser Phe Asp Asp Asn Ala Gly Lys Val Thr Arg Ile
                100                 105                 110


Leu Leu Gly Ser Glu Leu His Thr Arg Ala Ile Gln Gln Arg Leu Thr
            115                 120                 125
```

Page 13

Pro Lys Leu Pro Gln Thr Leu Pro Val Leu Leu Asp Glu Leu Asn His
    130   135   140

Ala Phe Gly Gln Val Leu Pro Ala Gly Asn Asp Gly Ser Asn Ala Trp
145   150   155   160

Ile Ser Val Asn Pro Tyr Glu Leu Val Leu Asn Leu Ala Thr Arg Ala
            165   170   175

Thr Ala Arg Leu Phe Val Gly Asp Leu Ile Cys Arg Asn Glu Ile Phe
        180   185   190

Leu Glu Thr Thr Ala Ser Phe Ser Arg Asn Thr Phe Asp Thr Ile Ser
    195   200   205

Thr Ser Arg Ser Phe Gly Asn Leu Phe Thr His Tyr Phe Ala Arg Trp
    210   215   220

Ile Ser Thr Ala Lys Glu Ala His Gly Gln Leu Gln Tyr Ile Gln Asn
225   230   235   240

Leu Leu Gly Ser Glu Val Gln Arg Arg Lys Leu Asn Ser Glu Glu Lys
            245   250   255

His Asp Asp Phe Leu Gln Trp Cys Thr Glu Leu Ala Val Thr Glu Asp
            260   265   270

Glu Ala Arg Pro Glu Ala Leu Ala His Arg Thr Leu Gly Ile Leu Ser
        275   280   285

Met Ala Val Ile His Thr Thr Ala Met Ala Leu Thr His Ile Leu Phe
    290   295   300

Asp Met Ile Ser Asp Asp Ser Leu Lys Glu Ser Leu Arg Arg Glu Gln
305   310   315   320

Gln Asn Val Leu Lys His Gly Trp Thr Glu Ile Thr Gln Gln Thr Met
            325   330   335

Leu Asp Met Lys Gln Leu Asp Ser Leu Met Arg Glu Ser Gln Arg Ile
        340   345   350

Asn Pro Val Gly Glu Phe Thr Phe Arg Arg Ile Val Arg Glu Arg Ile
        355   360   365

Thr Leu Ser Asp Gly Tyr Gln Leu Gln Pro Gly Gln Gln Ile Ala Ile
    370   375   380

Page 14

```
Pro Ala Lys Cys Ile Asn Thr Asp Ser Thr Lys Leu Ser Asp Ala His
385             390             395             400

Leu Phe Gln Pro Phe Arg Trp Leu Lys Gln Ser Gly Thr Ala Thr Thr
            405             410             415

Ser Phe Ser Asn Ser Ser Ala Leu Asn Leu His Phe Gly Phe Gly Arg
            420             425             430

Tyr Ala Cys Pro Gly Arg Phe Ile Ala Ser Tyr Met Ile Lys Ala Ile
        435             440             445

Met Ser Arg Ile Leu Leu Glu Tyr Asp Phe Lys Leu Asp Ser Glu Phe
    450             455             460

Pro Ser Arg Arg Pro Pro Asn Ile Val His Gly Asp Lys Ile Leu Pro
465             470             475             480

Asn Arg Asn Ala Val Val Leu Leu Arg Arg Leu Glu Lys Thr Val Thr
            485             490             495

Val Cys
```

```
<210>  11
<211>  1945
<212>  DNA
<213>  Neotyphodium lolii

<400>  11
atggcatttg caagtctttt gcaccatatc tggaaccatg cagtggattg cgctgagcag      60

ctgacttggt ggcagaccat tgtgagcttc atcattttct gcatcatgtg ctcttggcta     120

cctgggaatg gggaaatgcg cgctccgttt gttggttatc gctggccatt cgagcctact     180

ttctgggtcc gaatgcgctt catctttcag agtttaggca tgatgaccga aggatactca     240

aaggtgagct cccgtccggg tggagaaaga cagctagacg aatgactgac gccaaacgct     300

tgacagttca aggattccat gttcaagatc acgaccaacg atgccgactg gcttgtcctc     360

tcccaacgct acttggatga cttgcagtct ctgccagccg agagattgag ccatacagac     420

gctctagtga cggtgagggc gcatactagt cgctagtccc tacgacagtg gtgtgctaat     480

cgagttgtgt ctcatttaga tgtggggggag cagccacagc ccttttgctc tgctcaacaa     540

gagtgatctt agctctcgag ctcttcgtgt aaggaccaat ccctccttgt tatgcagaac     600

ggatctgact tgaaaaggac gtggttgcgc cgaattatgc caaggacctt gatagcctcg     660

tagacgaact ccgctattcg cttgagcacg atatagacat acaggatggt atgtatgcgc     720
```

```
ctattttcca actaattttg aggtcgtcat gttggctgac tgggtcgatg cgcttagact    780

ggaaaccgat tgatgccctt gaactttctt cgaagttggt gttgcggata tcgcagcgaa    840

tcttgatcgg ctggcccatg agtcgcgatc aagagctcct tgaatgcgca caaggctacg    900

cagacgctgg taagaggacg agctgttacg tatgaccctt ttcttcggta aaaactaacg    960

ggggtttcag ctaccgtcgt ccagtttgcc ctgaaactac ttcctcgcca gattcggccg   1020

cttgtctatc ctctgctccc acaagcatgg gctactaaat cgtggatcag gcgctgtgac   1080

aagatactgg caaaggaaat gcaacgtcga caagttttgg agaagtcgga tcccgtgtac   1140

gagaaaccaa aggacttgct gcagggcatg gtggacctgg agccgtcccg gcctgttgac   1200

aaacttggac atgattttct cgtccaagcc ttgatttcca gaatggctcc agttgttacc   1260

atggcccaaa cccttgttga tcttgccctc catcctgagg atatcgagga gctgcgtgat   1320

gaggttctgc aagtcatagg accagacggg gcgggattag gaaacctacg acaatcattt   1380

accaaacttg acaagatgga cagcgtcttg agggaatctg ccaggttcac ccctctatct   1440

atgagtaagt gccatttctg tcctccagaa tagcttgctg gcatgactaa tctgtggtat   1500

agtgacaatg caccgccggg ttcaggacgc caagggcatc acgctccatg acggtgtgca   1560

tcttccacga ggcacgcatg tggcattccc agcgtaccac attggcagag atcccaagtt   1620

ggtgtcaggt gcagatatct atgacgggct gcgctggtac aggaaggacc tcggcgaggc   1680

ccaagaaaac gaagctccca agcatcgatt tgtcaccccc gacagcaact acttgacctt   1740

tgggtccggt aaatacgtct gccccggccg atttatagcg gaacacatgt tgaagctgat   1800

gatgaccgcc gtgctcctgc gctacgagtt caagtggcct ccgggagtcc ctgtgcccga   1860

acaacagtat cggcatgtct ttgcttatcc aagcaaaacc acactgttga ttaaacgacg   1920

caaagatggc gatcagattc tttaa                                         1945
```

<210> 12
<211> 525
<212> PRT
<213> Neotyphodium lolii

<400> 12

```
Met Ala Phe Ala Ser Leu Leu His His Ile Trp Asn His Ala Val Asp
1               5                   10                  15


Cys Ala Glu Gln Leu Thr Trp Trp Gln Thr Ile Val Ser Phe Ile Ile
                20                  25                  30


Phe Cys Ile Met Cys Ser Trp Leu Pro Gly Asn Gly Glu Met Arg Ala
            35                  40                  45
```

```
Pro Phe Val Gly Tyr Arg Trp Pro Phe Glu Pro Thr Phe Trp Val Arg
    50              55              60

Met Arg Phe Ile Phe Gln Ser Leu Gly Met Met Thr Glu Gly Tyr Ser
65              70              75              80

Lys Phe Lys Asp Ser Met Phe Lys Ile Thr Thr Asn Asp Ala Asp Trp
            85              90              95

Leu Val Leu Ser Gln Arg Tyr Leu Asp Asp Leu Gln Ser Leu Pro Ala
            100             105             110

Glu Arg Leu Ser His Thr Asp Ala Leu Val Thr Met Trp Gly Ser Ser
        115             120             125

His Ser Pro Phe Ala Leu Leu Asn Lys Ser Asp Leu Ser Ser Arg Ala
    130             135             140

Leu Arg Asp Val Val Ala Pro Asn Tyr Ala Lys Asp Leu Asp Ser Leu
145             150             155             160

Val Asp Glu Leu Arg Tyr Ser Leu Glu His Asp Ile Asp Ile Gln Asp
            165             170             175

Asp Trp Lys Pro Ile Asp Ala Leu Glu Leu Ser Ser Lys Leu Val Leu
            180             185             190

Arg Ile Ser Gln Arg Ile Leu Ile Gly Trp Pro Met Ser Arg Asp Gln
        195             200             205

Glu Leu Leu Glu Cys Ala Gln Gly Tyr Ala Asp Ala Ala Thr Val Val
    210             215             220

Gln Phe Ala Leu Lys Leu Leu Pro Arg Gln Ile Arg Pro Leu Val Tyr
225             230             235             240

Pro Leu Leu Pro Gln Ala Trp Ala Thr Lys Ser Trp Ile Arg Arg Cys
            245             250             255

Asp Lys Ile Leu Ala Lys Glu Met Gln Arg Arg Gln Val Leu Glu Lys
            260             265             270

Ser Asp Pro Val Tyr Glu Lys Pro Lys Asp Leu Leu Gln Gly Met Val
    275             280             285

Asp Leu Glu Pro Ser Arg Pro Val Asp Lys Leu Gly His Asp Phe Leu
290             295             300
```

```
Val Gln Ala Leu Ile Ser Arg Met Ala Pro Val Val Thr Met Ala Gln
305             310             315             320

Thr Leu Val Asp Leu Ala Leu His Pro Glu Asp Ile Glu Glu Leu Arg
            325             330             335

Asp Glu Val Leu Gln Val Ile Gly Pro Asp Gly Ala Gly Leu Gly Asn
            340             345             350

Leu Arg Gln Ser Phe Thr Lys Leu Asp Lys Met Asp Ser Val Leu Arg
            355             360             365

Glu Ser Ala Arg Phe Thr Pro Leu Ser Met Met Thr Met His Arg Arg
        370             375             380

Val Gln Asp Ala Lys Gly Ile Thr Leu His Asp Gly Val His Leu Pro
385             390             395             400

Arg Gly Thr His Val Ala Phe Pro Ala Tyr His Ile Gly Arg Asp Pro
                405             410             415

Lys Leu Val Ser Gly Ala Asp Ile Tyr Asp Gly Leu Arg Trp Tyr Arg
            420             425             430

Lys Asp Leu Gly Glu Ala Gln Glu Asn Glu Ala Pro Lys His Arg Phe
            435             440             445

Val Thr Pro Asp Ser Asn Tyr Leu Thr Phe Gly Ser Gly Lys Tyr Val
    450             455             460

Cys Pro Gly Arg Phe Ile Ala Glu His Met Leu Lys Leu Met Met Thr
465             470             475             480

Ala Val Leu Leu Arg Tyr Glu Phe Lys Trp Pro Pro Gly Val Pro Val
            485             490             495

Pro Glu Gln Gln Tyr Arg His Val Phe Ala Tyr Pro Ser Lys Thr Thr
            500             505             510

Leu Leu Ile Lys Arg Arg Lys Asp Gly Asp Gln Ile Leu
            515             520             525
```

<210> 13
<211> 2014
<212> DNA
<213> Neotyphodium lolii

<400> 13

```
atgaagatgt taacagagca ttttgacttt cctaaactta acttcgccac cattgtaatt      60

tcaggcgcca ccattattgg tataatattc cttcgatatc ttaattaccc tacaaaggtt     120

tgaatctgtt tcccttgcta tgcacttttc ttggatgctc accaaaattt ttcaaggtga     180

atgtacctgt tgttggcatt ggagttcgat atacaaaatg ctagcggct attataaacg      240

tgcgtcatgc tcgacaatct atccgcgagg gctatgcaaa ggtttgtgtt aaaaacgaat     300

aaaagcgctt cgtaaacaaa gagaactaat actagtttct agtatggcga tttcgcgttt     360

cagataccta ctatgactcg aatggaggta ttcatttgtg atagacagat gacaagggag     420

tatcagaatg ttgacgacta tcatttgtcg ttccgagctg tcatgaccga ggtaagtaac     480

tagaccatgt taactgtagg aaaagaagaa aaagctaaac cgccgtacag gagtttcaat     540

tcaaatggct acttccagga caggcacacg aagcccggat tatccctaac tcagtgattg     600

ctaaggcctt gagctggcag agaacaaggg cgaataaacc cagcgatcca ttcttcgaat     660

ctttctccgc cgaattcatg caggggtttc aggaagagat gcgacgacta atccaatatc     720

aaaattcgtc agttatgtca aaccgctccg gtgctgtcct ggatccagcg catggttggc     780

atgctgtgcc ttgtttttcc ttggctctga aggtaattgg gcgccttact acatacgtct     840

tgttcggcaa acctttgtgc caagatgcga cattcctaaa catgtgctgt caatttggcg     900

atgtgattcc cagggatgcg atcatactac gttcatggcc agcattggca aggccgtaag     960

caagtgccta gacataaacc cgtcagggtt taaactcgca ttaacattca tatagtctta    1020

ttgtaaagat cttgagtgct ccaagggtta tgggaaagtt gcgaaacatt ttgattgttg    1080

agataaagag caggagagaa tcccacgaaa cgaacccaat gagtgtatgg ctgtctcgca    1140

cacccctct agcattacac attaacgtat atctaggata tcttggattt cacaatggcc     1200

tgggttgacc gtcatcctaa cgctagcttt gacgatcagc acattgccga gatgatgatt    1260

aacactattt tcgcagctct tcatacgtcg agtcaggtat attttttct gtatgaaaag     1320

tccagagctt aaagctaact ggctcatagc tggtggtgca taccatcttt gagcttgcct    1380

cacgtcctga atatagcgat gcgcttctgg aagagataga tgcatgcttt gaaaagcatg    1440

gaaagggcac taaagcagct ctagactcaa tgttcaaggt ggatagtttc atcaaagaaa    1500

cgcagaggtt taaccctctt gacgcatgta taaattccct gtctccgatt ccatcattgc    1560

gatttgacta acgccaccgt cagccgctct tgcaagactg gctctcaaag actttacttt    1620

ttccaatggc ctaaacatcc caaagggcag tgtgattttc acgccgaatt cgcctatctt    1680

tgaggacgag agatattaca aggatccgaa agtttttgat ggatttcggt ttgctaggat    1740

gcgtaatgac ccaaaattag gtctattctg cgacctaaca gcaacgaatg aacaaagcat    1800

gcattttggg actggacgtc acgcctgtcc tggtagattt atggtttctg atgaggtcaa    1860

gttagctgtg attcatatct taagtaattt cgattttgt attgagaatt ttggaccacg     1920
```

Page 19

gccagcaaat cagccatttg gtaaatttct tctacctgat atgagtgcaa aaatctggct   1980

aagggagaaa agagctaggg agaagaatct gtga   2014

<210> 14
<211> 537
<212> PRT
<213> Neotyphodium lolii

<400> 14

Met Lys Met Leu Thr Glu His Phe Asp Phe Pro Lys Leu Asn Phe Ala
1   5   10   15

Thr Ile Val Ile Ser Gly Ala Thr Ile Ile Gly Ile Ile Phe Leu Arg
            20   25   30

Tyr Leu Asn Tyr Pro Thr Lys Val Asn Val Pro Val Val Gly Ile Gly
        35   40   45

Val Arg Tyr Thr Lys Trp Leu Ala Ala Ile Ile Asn Val Arg His Ala
    50   55   60

Arg Gln Ser Ile Arg Glu Gly Tyr Ala Lys Tyr Gly Asp Phe Ala Phe
65   70   75   80

Gln Ile Pro Thr Met Thr Arg Met Glu Val Phe Ile Cys Asp Arg Gln
                85   90   95

Met Thr Arg Glu Tyr Gln Asn Val Asp Asp Tyr His Leu Ser Phe Arg
                100   105   110

Ala Val Met Thr Glu Glu Phe Gln Phe Lys Trp Leu Leu Pro Gly Gln
            115   120   125

Ala His Glu Ala Arg Ile Ile Pro Asn Ser Val Ile Ala Lys Ala Leu
    130   135   140

Ser Trp Gln Arg Thr Arg Ala Asn Lys Pro Ser Asp Pro Phe Phe Glu
145   150   155   160

Ser Phe Ser Ala Glu Phe Met Gln Gly Phe Gln Glu Glu Met Arg Arg
                165   170   175

Leu Ile Gln Tyr Gln Asn Ser Ser Val Met Ser Asn Arg Ser Gly Ala
            180   185   190

Val Leu Asp Pro Ala His Gly Trp His Ala Val Pro Cys Phe Pro Leu
        195   200   205

Page 20

Ala Leu Lys Val Ile Gly Arg Leu Thr Thr Tyr Val Leu Phe Gly Lys
    210   215   220

Pro Leu Cys Gln Asp Ala Thr Phe Leu Asn Met Cys Cys Gln Phe Gly
225   230   235   240

Asp Val Ile Pro Arg Asp Ala Ile Ile Leu Arg Ser Trp Pro Ala Leu
            245   250   255

Ala Arg Pro Leu Ile Val Lys Ile Leu Ser Ala Pro Arg Val Met Gly
            260   265   270

Lys Leu Arg Asn Ile Leu Ile Val Glu Ile Lys Ser Arg Arg Glu Ser
        275   280   285

His Glu Thr Asn Pro Met Ser Asp Ile Leu Asp Phe Thr Met Ala Trp
    290   295   300

Val Asp Arg His Pro Asn Ala Ser Phe Asp Asp Gln His Ile Ala Glu
305   310   315   320

Met Met Ile Asn Thr Ile Phe Ala Ala Leu His Thr Ser Ser Gln Leu
            325   330   335

Val Val His Thr Ile Phe Glu Leu Ala Ser Arg Pro Glu Tyr Ser Asp
            340   345   350

Ala Leu Leu Glu Glu Ile Asp Ala Cys Phe Glu Lys His Gly Lys Gly
        355   360   365

Thr Lys Ala Ala Leu Asp Ser Met Phe Lys Val Asp Ser Phe Ile Lys
    370   375   380

Glu Thr Gln Arg Phe Asn Pro Leu Asp Ala Ser Ala Leu Ala Arg Leu
385   390   395   400

Ala Leu Lys Asp Phe Thr Phe Ser Asn Gly Leu Asn Ile Pro Lys Gly
            405   410   415

Ser Val Ile Phe Thr Pro Asn Ser Pro Ile Phe Glu Asp Glu Arg Tyr
            420   425   430

Tyr Lys Asp Pro Lys Val Phe Asp Gly Phe Arg Phe Ala Arg Met Arg
        435   440   445

Asn Asp Pro Lys Leu Gly Leu Phe Cys Asp Leu Thr Ala Thr Asn Glu

```
    450              455              460
```

```
Gln Ser Met His Phe Gly Thr Gly Arg His Ala Cys Pro Gly Arg Phe
465              470              475              480
```

```
Met Val Ser Asp Glu Val Lys Leu Ala Val Ile His Ile Leu Ser Asn
                 485              490              495
```

```
Phe Asp Phe Cys Ile Glu Asn Phe Gly Pro Arg Pro Ala Asn Gln Pro
                 500              505              510
```

```
Phe Gly Lys Phe Leu Leu Pro Asp Met Ser Ala Lys Ile Trp Leu Arg
             515              520              525
```

```
Glu Lys Arg Ala Arg Glu Lys Asn Leu
    530              535
```

```
<210>   15
<211>   1496
<212>   DNA
<213>   Neotyphodium lolii

<400>   15
atgattgcga aaaatattga actcaatggc ttggatccgg caaccagggc attggacatt    60

ctatactgga aaaatcactg catcaaacag ctagaatctc tcctatgcgc cacagattca   120

tactgcactg cagacaaggc cgctcaacta cgcattttgt cagagttggt gctccccaat   180

cttggccctc ggccgtccaa tgccactggg ccatcctatc ttacacgaag tggttcccca   240

ataatgttaa gtctaaatac aacatcatca aaaaactgcg tcagatattg ctgggagatt   300

ctaggggcga ctggcgcaag taatgatgat cctttggcag tccaagttgc taaggatgta   360

gtggcttctc tgtctgctac ttttcgcctt tcaacaaaat ggagcgaaac tctactgtcc   420

aattttgcag taacaccaga ccaagctcga caagttatta acatgctacc cgagtggatt   480

caaggcttcg tacctgaggg aatggagtgc gattttccaa agagaatccc gttcgccatg   540

acatcattcg acctaaatgg ctccaatgta gctatgaagc tctacgttaa tccaagggta   600

aaggagattt taactggtac tccctcatca gacttggtct gggagttcct ccgaaattta   660

acaccagaaa tgaaaccacg agcggtcgac ttgcttgaga ggtaagaatg ctttgaact    720

ttcgcccacc ttgtcagccc catacgctaa gcgctaactc cccacacatt aacaggttta   780

ttaccgataa ttcaggcccg tctgctattg agcttgtagg tattgactgc gttgacgacg   840

ctcacctatc aaatgcaagg gtcaagcttt acgttcatac catgagcagc tcatttaaca   900

ccgtaaagaa ttatgttact cttgggggtg caatctggga tgaacaaacc caaaagggct   960

taggaatact acaaagtatt tggcacctat tgcttcagga gccagagggt atttctgaca  1020
```

```
atggattcga caagcctgtg aacgactctt ccatgttatg ccaaaagcta tattttagtt    1080

tcgagctacg cccaggtaca gacttccctc aggtgaagac ctatgtgcca acttggaact    1140

atcttcgaac cgacggggaa actatccaga actatgaggc gatcttccga gcttgtgacc    1200

atccttgggg tgaagatagg acgtacggca aaattttttca agatgcattg taagttatcc    1260

cttcagatta gcgctaaaag gagtttgaga tactcctcaa tgcaagctat taggttgtga    1320

aattgccact actaattgga gctttttata gcggacctgc aaccgagagt cggaaaaaac    1380

ccattcactg cgacgcatct tttctgttta ccgaagaaac tggtgtctac cagacgctgt    1440

atttcagtcc tccgattgag ggggaaacag aagtccagtc aaatctcgtt gcttga        1496
```

<210> 16
<211> 439
<212> PRT
<213> Neotyphodium lolii

<400> 16

```
Met Ile Ala Lys Asn Ile Glu Leu Asn Gly Leu Asp Pro Ala Thr Arg
1               5                   10                  15


Ala Leu Asp Ile Leu Tyr Trp Lys Asn His Cys Ile Lys Gln Leu Glu
            20                  25                  30


Ser Leu Leu Cys Ala Thr Asp Ser Tyr Cys Thr Ala Asp Lys Ala Ala
        35                  40                  45


Gln Leu Arg Ile Leu Ser Glu Leu Val Leu Pro Asn Leu Gly Pro Arg
    50                  55                  60


Pro Ser Asn Ala Thr Gly Pro Ser Tyr Leu Thr Arg Ser Gly Ser Pro
65                  70                  75                  80


Ile Met Leu Ser Leu Asn Thr Thr Ser Ser Lys Asn Cys Val Arg Tyr
                85                  90                  95


Cys Trp Glu Ile Leu Gly Ala Thr Gly Ala Ser Asn Asp Asp Pro Leu
            100                 105                 110


Ala Val Gln Val Ala Lys Asp Val Val Ala Ser Leu Ser Ala Thr Phe
        115                 120                 125


Arg Leu Ser Thr Lys Trp Ser Glu Thr Leu Leu Ser Asn Phe Ala Val
    130                 135                 140


Thr Pro Asp Gln Ala Arg Gln Val Ile Asn Met Leu Pro Glu Trp Ile
145                 150                 155                 160
```

Page 23

Gln Gly Phe Val Pro Glu Gly Met Glu Cys Asp Phe Pro Lys Arg Ile
            165   170   175

Pro Phe Ala Met Thr Ser Phe Asp Leu Asn Gly Ser Asn Val Ala Met
            180   185   190

Lys Leu Tyr Val Asn Pro Arg Val Lys Glu Ile Leu Thr Gly Thr Pro
            195   200   205

Ser Ser Asp Leu Val Trp Glu Phe Leu Arg Asn Leu Thr Pro Glu Met
    210   215   220

Lys Pro Arg Ala Val Asp Leu Leu Glu Arg Phe Ile Thr Asp Asn Ser
225   230   235   240

Gly Pro Ser Ala Ile Glu Leu Val Gly Ile Asp Cys Val Asp Asp Ala
            245   250   255

His Leu Ser Asn Ala Arg Val Lys Leu Tyr Val His Thr Met Ser Ser
            260   265   270

Ser Phe Asn Thr Val Lys Asn Tyr Val Thr Leu Gly Gly Ala Ile Trp
            275   280   285

Asp Glu Gln Thr Gln Lys Gly Leu Gly Ile Leu Gln Ser Ile Trp His
    290   295   300

Leu Leu Leu Gln Glu Pro Glu Gly Ile Ser Asp Asn Gly Phe Asp Lys
305   310   315   320

Pro Val Asn Asp Ser Ser Met Leu Cys Gln Lys Leu Tyr Phe Ser Phe
            325   330   335

Glu Leu Arg Pro Gly Thr Asp Phe Pro Gln Val Lys Thr Tyr Val Pro
            340   345   350

Thr Trp Asn Tyr Leu Arg Thr Asp Gly Glu Thr Ile Gln Asn Tyr Glu
            355   360   365

Ala Ile Phe Arg Ala Cys Asp His Pro Trp Gly Glu Asp Arg Thr Tyr
    370   375   380

Gly Lys Ile Phe Gln Asp Ala Phe Gly Pro Ala Thr Glu Ser Arg Lys
385   390   395   400

Lys Pro Ile His Cys Asp Ala Ser Phe Leu Phe Thr Glu Glu Thr Gly
            405   410   415

Page 24

Val Tyr Gln Thr Leu Tyr Phe Ser Pro Pro Ile Glu Gly Glu Thr Glu
        420   425   430

Val Gln Ser Asn Leu Val Ala
       435

<210> 17
<211> 1110
<212> DNA
<213> Epichloe festucae

<400> 17
```
atgacgatgg ctgccaatga ctttccattt caatgccagg agaagaaatc atattctcag    60
ccaagtctag tctactgcaa tggtaacatt gcggagacgt atctcgaaga aaaggtattt   120
atactgctcc tttataatct cgaatgccac ttaaaattta gacaggtttt gacagcgccg   180
ttggattatt tgcgtgcctt acctagcaaa gatattcgca gtggactgac cgacgccatt   240
aatgagttcc tgcgtgtccc agaggaaaag gttcttgtca taaagcgtat aattgatctt   300
cttcacaatg catccttact gtaagttcga gattgcataa catagaccta gtagattcta   360
actaacagct ttagcattga tgatatccag gattcatcta aactgcgacg tggagtccct   420
gtagcccacc acatatttgg aatcgcacaa acaataaatt cggccaatct agcgtatttc   480
attgcccaga gagagcttga gaagcttacg aatcctcgag catttgctat atataatgag   540
gagctaatca atctgcatcg tggtcagggt atggagctcc attggagaga atcgctccat   600
tgccctaccg aagatgagta tctgcgaatg atccaaaaga agacaggcgg tctgttccga   660
ttggcaatca gactgctgca aggcgaaagc gctagcgatg acgattatgt ctcacttatt   720
gatactctcg gaaccctgtt ccagattcga gatgactatc aaaacttaca gagtgatata   780
tattctaaga acaaaggcta ctgtgaggat ttaacagagg gcaaattctc gtatccggtc   840
atccatagta ttcggtcgcg accaggagat gttcgattaa tcaatatttt gaaacagcgt   900
agtgaagatg ttatggtgaa gcaatacgcg gtgcaacata tcgaatctac aggaagcttc   960
gcattctgtc aaaataaaat tcaatctttg gtggagcaag caagagagca attggcggct  1020
ctagaaaata gcagttcatg tggaggcccc gttcgcgaca tccttgacaa gttagcaata  1080
aaaccacggg caaatataga agtagagtag                                    1110
```

<210> 18
<211> 334
<212> PRT
<213> Epichloe festucae

<400> 18

Met Thr Met Ala Ala Asn Asp Phe Pro Phe Gln Cys Gln Glu Lys Lys

```
1                 5                         10                        15

Ser Tyr Ser Gln Pro Ser Leu Val Tyr Cys Asn Gly Asn Ile Ala Glu
            20              25                  30

Thr Tyr Leu Glu Glu Lys Val Leu Thr Ala Pro Leu Asp Tyr Leu Arg
            35              40                  45

Ala Leu Pro Ser Lys Asp Ile Arg Ser Gly Leu Thr Asp Ala Ile Asn
        50              55                  60

Glu Phe Leu Arg Val Pro Glu Glu Lys Val Leu Val Ile Lys Arg Ile
65                  70                  75                  80

Ile Asp Leu Leu His Asn Ala Ser Leu Leu Ile Asp Asp Ile Gln Asp
            85              90                  95

Ser Ser Lys Leu Arg Arg Gly Val Pro Val Ala His His Ile Phe Gly
            100             105                 110

Ile Ala Gln Thr Ile Asn Ser Ala Asn Leu Ala Tyr Phe Ile Ala Gln
            115             120                 125

Arg Glu Leu Glu Lys Leu Thr Asn Pro Arg Ala Phe Ala Ile Tyr Asn
        130             135                 140

Glu Glu Leu Ile Asn Leu His Arg Gly Gln Gly Met Glu Leu His Trp
145                 150                 155                 160

Arg Glu Ser Leu His Cys Pro Thr Glu Asp Glu Tyr Leu Arg Met Ile
            165             170                 175

Gln Lys Lys Thr Gly Gly Leu Phe Arg Leu Ala Ile Arg Leu Leu Gln
            180             185                 190

Gly Glu Ser Ala Ser Asp Asp Asp Tyr Val Ser Leu Ile Asp Thr Leu
        195             200                 205

Gly Thr Leu Phe Gln Ile Arg Asp Asp Tyr Gln Asn Leu Gln Ser Asp
        210             215                 220

Ile Tyr Ser Lys Asn Lys Gly Tyr Cys Glu Asp Leu Thr Glu Gly Lys
225                 230                 235                 240

Phe Ser Tyr Pro Val Ile His Ser Ile Arg Ser Arg Pro Gly Asp Val
            245             250                 255
```

Page 26

```
Arg Leu Ile Asn Ile Leu Lys Gln Arg Ser Glu Asp Val Met Val Lys
        260             265             270


Gln Tyr Ala Val Gln His Ile Glu Ser Thr Gly Ser Phe Ala Phe Cys
        275             280             285


Gln Asn Lys Ile Gln Ser Leu Val Glu Gln Ala Arg Glu Gln Leu Ala
    290             295             300


Ala Leu Glu Asn Ser Ser Ser Cys Gly Gly Pro Val Arg Asp Ile Leu
305             310             315             320


Asp Lys Leu Ala Ile Lys Pro Arg Ala Asn Ile Glu Val Glu
                325             330
```

```
<210>   19
<211>   1647
<212>   DNA
<213>   Epichloe festucae

<400>   19
atgactagcg acttcaaggt aataatcgtg ggaggatcag tggctgggct ttcactagcc    60

cactgcttag aaaaaatcgg tgtttctttc gtggttctag agaagggtaa tcaaatagct   120

ccccaactcg gtgcctcaat tggcattttg ccaaatggtg gacgtattct tgatcaactg   180

ggcatcttcc atagcatcga ggatgaaatc gaacctctag aatctgctat gatgagatac   240

ccggatggct ctctctttcaa aagtcaatat ccccaagctt tgcatactag gtaataacag   300

tgaaagaaga gtggcctata agtgttcata tatcgctaac ttcgtgcggt aatagttttt   360

ggttatcccg tggctttcct tgagaggcaa aggtttcttc agatacttta tgataaactc   420

aagagcaaag actgcgtttt tacaaacaag cgggtagtca gtattgcaag tggccaagac   480

aaagtcacag caaagacttc agatggcgct aagtacttag cagatatcgt gatcggtgct   540

gacggggtcc acagcatcgt caggtcagag atttggaggc atttgaagga aaactctcaa   600

atatcagtat tagaggcacc gaacgcaagt aggttaacct aggattaatt gcaaagaaac   660

tttactaatg agggagccac ttaggtatta agcatgatta ttcatgcatt tacggaattt   720

cttttaaacgt tccccagatc atcctaggaa tacagttaaa ctgtttagat gacggagtgt   780

caatacactt gtttacgggt aaacaatcca aattattttg gtttgttatc atcaaaacgc   840

ctcaggctag ctttgctaaa gtagagattg acaatacaca tacagcaagg tgtatctgcg   900

aaggactgag gacgaaaaag gtttcagata ccttatgttt tgaagatgta tggtcaagat   960

gcaccatatt caagatgacg cctcttgagg aaggggtgtt taagcattgg aactatggcc  1020

gcttagcatg tattggtgat gctatccgca aggtatgtgg atgatgctat atgtccctat  1080

ttcgtgtcat cagtgggatg acaaaagaag gccactattt gccgctaata taaatgatcg  1140
```
Page 27

```
tatcgctaac attaacagat ggccccaaat aatgggcaag gagcaaatat ggcgatagag   1200

gacgcttgca gtctcgcaaa catcctccag aaaaagatat cacatggttc gattcgagac   1260

caagatatca attcaatgtt tcaggaattc tctatggctc aacgggctcg cacggagagc   1320

gtctgcgcgc agtcggagtt tctagtccgc atgcatgcga atcaaggtat tggaagaaga   1380

cttcttgggc ggtaccttat tcctttcctg tatgacgcac ctgctggttt atctggattt   1440

tctataagtg gcgcaacaag aatagagttc atagacttgc ccactagatc tcttagggga   1500

gcgtggggaa agtcatggag agggtcatgg gaattcatcc tacaaagctt ggtctatttg   1560

cgacccaagt ttaggatagt ttatgccttg tatctcgttg cagctgcagc ttttatcttg   1620

tattgtctta gcagtctctt cccgtag                                       1647
```

<210> 20
<211> 472
<212> PRT
<213> Epichloe festucae

<400> 20

```
Met Thr Ser Asp Phe Lys Val Ile Ile Val Gly Gly Ser Val Ala Gly
1               5                   10                  15


Leu Ser Leu Ala His Cys Leu Glu Lys Ile Gly Val Ser Phe Val Val
            20                  25                  30


Leu Glu Lys Gly Asn Gln Ile Ala Pro Gln Leu Gly Ala Ser Ile Gly
        35                  40                  45


Ile Leu Pro Asn Gly Gly Arg Ile Leu Asp Gln Leu Gly Ile Phe His
    50                  55                  60


Ser Ile Glu Asp Glu Ile Glu Pro Leu Glu Ser Ala Met Met Arg Tyr
65                  70                  75                  80


Pro Asp Gly Phe Ser Phe Lys Ser Gln Tyr Pro Gln Ala Leu His Thr
                85                  90                  95


Ser Phe Gly Tyr Pro Val Ala Phe Leu Glu Arg Gln Arg Phe Leu Gln
            100                 105                 110


Ile Leu Tyr Asp Lys Leu Lys Ser Lys Asp Cys Val Phe Thr Asn Lys
        115                 120                 125


Arg Val Val Ser Ile Ala Ser Gly Gln Asp Lys Val Thr Ala Lys Thr
    130                 135                 140
```

Page 28

Ser Asp Gly Ala Lys Tyr Leu Ala Asp Ile Val Ile Gly Ala Asp Gly
145   150   155   160

Val His Ser Ile Val Arg Ser Glu Ile Trp Arg His Leu Lys Glu Asn
            165   170   175

Ser Gln Ile Ser Val Leu Glu Ala Pro Asn Ala Ser Ile Lys His Asp
            180   185   190

Tyr Ser Cys Ile Tyr Gly Ile Ser Leu Asn Val Pro Gln Ile Ile Leu
            195   200   205

Gly Ile Gln Leu Asn Cys Leu Asp Asp Gly Val Ser Ile His Leu Phe
    210   215   220

Thr Gly Lys Gln Ser Lys Leu Phe Trp Phe Val Ile Ile Lys Thr Pro
225   230   235   240

Gln Ala Ser Phe Ala Lys Val Glu Ile Asp Asn Thr His Thr Ala Arg
            245   250   255

Cys Ile Cys Glu Gly Leu Arg Thr Lys Lys Val Ser Asp Thr Leu Cys
            260   265   270

Phe Glu Asp Val Trp Ser Arg Cys Thr Ile Phe Lys Met Thr Pro Leu
            275   280   285

Glu Glu Gly Val Phe Lys His Trp Asn Tyr Gly Arg Leu Ala Cys Ile
    290   295   300

Gly Asp Ala Ile Arg Lys Met Ala Pro Asn Asn Gly Gln Gly Ala Asn
305   310   315   320

Met Ala Ile Glu Asp Ala Cys Ser Leu Ala Asn Ile Leu Gln Lys Lys
            325   330   335

Ile Ser His Gly Ser Ile Arg Asp Gln Asp Ile Asn Ser Met Phe Gln
            340   345   350

Glu Phe Ser Met Ala Gln Arg Ala Arg Thr Glu Ser Val Cys Ala Gln
            355   360   365

Ser Glu Phe Leu Val Arg Met His Ala Asn Gln Gly Ile Gly Arg Arg
    370   375   380

Leu Leu Gly Arg Tyr Leu Ile Pro Phe Leu Tyr Asp Ala Pro Ala Gly
385   390   395   400

Page 29

```
Leu Ser Gly Phe Ser Ile Ser Gly Ala Thr Arg Ile Glu Phe Ile Asp
            405                 410                 415


Leu Pro Thr Arg Ser Leu Arg Gly Ala Trp Gly Lys Ser Trp Arg Gly
            420                 425                 430


Ser Trp Glu Phe Ile Leu Gln Ser Leu Val Tyr Leu Arg Pro Lys Phe
            435                 440                 445


Arg Ile Val Tyr Ala Leu Tyr Leu Val Ala Ala Ala Ala Phe Ile Leu
    450                 455                 460


Tyr Cys Leu Ser Ser Leu Phe Pro
465                 470
```

```
<210>  21
<211>  2063
<212>  DNA
<213>  Epichloe festucae

<400>  21
atgcaatacg gtaatttaac aactgtatta cttctgcgta atactttatt gtccttgaat    60

tcttcgtcaa tctgccatgt tcactggctg caagtgattg tggctctgct tgtcttgatc   120

gtctgcatct ttctatattg gcgaacaccc actggcatca atgctccttt cgcaggatat   180

cgttcaccat gggagccgcc gctcttggtt cagatgcgtt acgtcttcaa cgctgcctca   240

atgatacgcg aaggatatgc taaggtatgt tttatcccgc gtagaggtct tctacccgga   300

tagaccgaga agataacaac ttcggaacag tggaaagact ccttgttcca gatctcacga   360

tacgacggtg acattcttat tgtgcctcca agatatttgg atgacctcca caacaagtca   420

caagaggagt taagtgctat ttatggtttg attcgggtga ggaatgccac caaccaaaaa   480

acgcagagcc tattagcgca tggtctcaca tattcgaatt tgctagaatt ttggtggtag   540

ctatagcggc atcaccctgc ttggagaaaa cgatgttggc attcgtgcgc ttcaggtatg   600

tacacccttc caaaagtctg ttagggacct tccttactct actacagaca aaaatcaccc   660

caaatcttgc gaaattatgc gatgacataa gggatgagtt tcagtattgt ctagatacag   720

acttcccagc ctgcagaggt atgccatttc caaaatccca ttatgcagtc tctactttt    780

ctggcactaa cgatatctaa catagattgg acatcagtgt ccgtgcatcc attgtttcta   840

aaagcagtcg aaaggataac acatcggatt tttgttggat tgccattatg tcggaatccc   900

caatgggtcc aagcgaccag caagcatgca cattacggta cgtcaattga ctaataatag   960

gcaatatacg cgctcatatg ctttgcagca acaatgatac agatagctat gagatctgtc  1020

ccaaagttca ttcagccttt actaaatttt tgccttccgt ggccatggaa gaacgcagcc  1080
```

```
tgtgttcgtg aagcaaagaa tgcccttata ttagaaatgc aacgccgacg aaatctcgag   1140

aaagttaaca gttttgatta tatcaaatcc aatgacttgc tgcaagcagt tatggaaatg   1200

tcttctccta gtcatgagga tagccagctt gatgttgtcg cccagataat gctcacgatg   1260

aacacaatcg ctggccacag tactgccgca tccggagcac atgcactgtt cgatatggtt   1320

agccactcta agtatattga attgctgcgt gaggaggctc ttcaagtctt tcgacatgtt   1380

gaactgcgtg ttacaaaaca ggctttgggg gatttgcgaa aattggacag cttcctcaga   1440

gagttagtat tgtcctaaac atcacaatct caccacattc tcacgctagc ttttcctccg   1500

tactaatgat ggtcgttgct aagatcccaa cgacataatc cgctaagctt gtgtatgttt   1560

agctaagagt ctcgaaaacc tggaaatgtt tgtcctgtgc ccgagttcta acgtctctta   1620

ctacagtagg cttttttcgg gtcgtattag accctgccgg tatcacactt caagatggca   1680

cacatgttcc ttacaacaca ctgctttgtg tcgcaccaca tgcgatatcc aatgacccgg   1740

atgtgataga agacccaacc tcgttcaacg gtctgcgata ctacgaacag cgctgtcgtg   1800

acgccagtca agagaaaaag catcaatacg ctactacgga taaatctcac ctgcattttg   1860

gctacggaac ctgggcctgt ccaggccgct tcttggcctc tgatatgtta aaagtgattc   1920

taacgatgct tctgcttcag tatgacatcc gctcccccga gagagcaaaa cggcctgtgg   1980

caggtcattt tcatgagttt ccgcttttca atattaacac accactgtta atgaaacgac   2040

gcaatgattc gctagttcta tga                                          2063
```

<210> 22
<211> 533
<212> PRT
<213> Epichloe festucae

<400> 22

```
Met Gln Tyr Gly Asn Leu Thr Thr Val Leu Leu Leu Arg Asn Thr Leu
1               5                   10                  15


Leu Ser Leu Asn Ser Ser Ser Ile Cys His Val His Trp Leu Gln Val
            20                  25                  30


Ile Val Ala Leu Leu Val Leu Ile Val Cys Ile Phe Leu Tyr Trp Arg
        35                  40                  45


Thr Pro Thr Gly Ile Asn Ala Pro Phe Ala Gly Tyr Arg Ser Pro Trp
    50                  55                  60


Glu Pro Pro Leu Leu Val Gln Met Arg Tyr Val Phe Asn Ala Ala Ser
65                  70                  75                  80


Met Ile Arg Glu Gly Tyr Ala Lys Trp Lys Asp Ser Leu Phe Gln Ile
```

```
                85                    90                    95
```

Ser Arg Tyr Asp Gly Asp Ile Leu Ile Val Pro Pro Arg Tyr Leu Asp
            100   105   110

Asp Leu His Asn Lys Ser Gln Glu Glu Leu Ser Ala Ile Tyr Gly Leu
        115   120   125

Ile Arg Asn Phe Gly Gly Ser Tyr Ser Gly Ile Thr Leu Leu Gly Glu
    130   135   140

Asn Asp Val Gly Ile Arg Ala Leu Gln Thr Lys Ile Thr Pro Asn Leu
145   150   155   160

Ala Lys Leu Cys Asp Asp Ile Arg Asp Glu Phe Gln Tyr Cys Leu Asp
            165   170   175

Thr Asp Phe Pro Ala Cys Arg Asp Trp Thr Ser Val Ser Val His Pro
            180   185   190

Leu Phe Leu Lys Ala Val Glu Arg Ile Thr His Arg Ile Phe Val Gly
        195   200   205

Leu Pro Leu Cys Arg Asn Pro Gln Trp Val Gln Ala Thr Ser Lys His
    210   215   220

Ala His Tyr Ala Thr Met Ile Gln Ile Ala Met Arg Ser Val Pro Lys
225   230   235   240

Phe Ile Gln Pro Leu Leu Asn Phe Cys Leu Pro Trp Pro Trp Lys Asn
            245   250   255

Ala Ala Cys Val Arg Glu Ala Lys Asn Ala Leu Ile Leu Glu Met Gln
            260   265   270

Arg Arg Arg Asn Leu Glu Lys Val Asn Ser Phe Asp Tyr Ile Lys Ser
        275   280   285

Asn Asp Leu Leu Gln Ala Val Met Glu Met Ser Ser Pro Ser His Glu
    290   295   300

Asp Ser Gln Leu Asp Val Val Ala Gln Ile Met Leu Thr Met Asn Thr
305   310   315   320

Ile Ala Gly His Ser Thr Ala Ala Ser Gly Ala His Ala Leu Phe Asp
            325   330   335

```
Met Val Ser His Ser Lys Tyr Ile Glu Leu Leu Arg Glu Glu Ala Leu
            340                 345                 350

Gln Val Phe Arg His Val Glu Leu Arg Val Thr Lys Gln Ala Leu Gly
            355                 360                 365

Asp Leu Arg Lys Leu Asp Ser Phe Leu Arg Glu Ser Gln Arg His Asn
    370                 375                 380

Pro Leu Ser Leu Leu Gly Phe Phe Arg Val Val Leu Asp Pro Ala Gly
385                 390                 395                 400

Ile Thr Leu Gln Asp Gly Thr His Val Pro Tyr Asn Thr Leu Leu Cys
            405                 410                 415

Val Ala Pro His Ala Ile Ser Asn Asp Pro Asp Val Ile Glu Asp Pro
            420                 425                 430

Thr Ser Phe Asn Gly Leu Arg Tyr Tyr Glu Gln Arg Cys Arg Asp Ala
            435                 440                 445

Ser Gln Glu Lys Lys His Gln Tyr Ala Thr Thr Asp Lys Ser His Leu
    450                 455                 460

His Phe Gly Tyr Gly Thr Trp Ala Cys Pro Gly Arg Phe Leu Ala Ser
465                 470                 475                 480

Asp Met Leu Lys Val Ile Leu Thr Met Leu Leu Gln Tyr Asp Ile
            485                 490                 495

Arg Ser Pro Glu Arg Ala Lys Arg Pro Val Ala Gly His Phe His Glu
            500                 505                 510

Phe Pro Leu Phe Asn Ile Asn Thr Pro Leu Leu Met Lys Arg Arg Asn
    515                 520                 525

Asp Ser Leu Val Leu
    530
```

<210> 23
<211> 11400
<212> DNA
<213> Neotyphodium lolii

<400> 23

```
aatggactag aaagtacatt tgttatacag tgctatctcc ttaggctcag tctaccttgt     60

gggtcagtgc aggccccaca ggccccctgc cacaaggtta gtaaccgcgc aagcacgcga    120

aagtgtagcg tagtaaatta tataggaaaa attagcagta tattaattat tagcctatct    180
```

```
atatataagt aaatatacct ttaattcact tctatttaat tggatataga ccctagttaa      240

cgtgacttca caaggtgaac taagtccaag aagatagagg taattgcagt gagatccaca      300

ggtcttgtca ggggacggca atgtatgcat atatcgtgaa atcaatgcta gcggcattga      360

atcaatgact tctgtagcta gcgataatag cagcgataga agcctctaga atctatatag      420

acagtattaa gtaaactctc cacctgtatc cacagctaac ttacatacac ctagccctgt      480

cttgagtgct tttagaagac tatgctaact tagatcacac cctaagtgcc aatgtctccc      540

aattagccgc gaagagagaa cttatcgcaa ggaagtgata aggctataac atccaacagg      600

ttacttaaag acaacaggct aggaatcaat tatagtagca atcaaaacta gatcctgtat      660

tctataacaa gaagttaaat cccccctaga ctatctgtct atctttagtt atactttggt      720

tttgctttgt tgtcttatgc ctacattcct aaaagatctt tatgacgatg gctgccaatg      780

actttccatt tcaatgccag gagaagaaat catattctca gccaagtcta gtctactgca      840

atggtaacat tgcggagacg tatctcgaag aaaaggtatt tatactgctc ctttataatc      900

tcgaatgcca cttaaaattt agacaggttt tgacagcgcc gttggattat ttgcgtgcct      960

tacctagcaa agatattcgc agtggactga ccgacgccat taatgagttc ctgcgtgtcc     1020

cagaggaaaa ggttcttgtc ataaagcgta taattgatct tcttcacaat gcatccttac     1080

tgtaagttcg agattgcata acatagacct agtagattct aactaacagc tttagcattg     1140

atgatatcca ggattcatcc aaactgcgac gtggagtccc tgtagcccac cacatatttg     1200

gaatcgcaca aacaataaat tcggccaatc tagcgtattt cattgcccag agagagcttg     1260

agaagcttac gaatcctcga gcatttgcta tatataatga ggagctaatc aatctgcatc     1320

gtggtcaggg tatggagctc cattggagag aatcgctcca ttgccctacc gaagatgagt     1380

atctgcgaat gatccaaaag aagacaggcg gtctgttccg attggcaatc agactgctgc     1440

aaggcgaaag cgctagcgat gacgattatg tctcacttat tgatactctc ggaaccctgt     1500

tccagattcg agatgactat caaaacttac agagtgatat atattctaag aacaaaggct     1560

actgtgagga tttaacagag ggcaaattct cgtatccggt catccatagt attcggtcgc     1620

gaccaggaga tgttcgatta atcaatattt tgaaacagcg tagtgaagat gttatggtga     1680

agcaatacgc ggtgcaacat atcgaatcta caggaagctt cgcattctgt caaaataaaa     1740

ttcaatcttt ggtggagcaa gcaagagagc aattggcggc tctagaaaat agcagttcat     1800

gtggaggccc cgttcgcgac atccttgaca agttagcaat aaaaccacgg gcaaatatag     1860

aagtagagta gttgacatta agaacattgc gataaaagac acttttacta tactcgacta     1920

gttttaaaac tatgtgtgag attaagacgt cttcaggtac tcaaagtgtg gaagtatgtc     1980

acgcagaaaa gagctaacat tgctctcagc ttcctcacta tttagtttca ccaagagcat     2040
```

```
ccttcataga gacatttgcg gctgtgattt tcgtttacgt catgttgtta aacattgttg    2100

tatggtatct ttgcttagga gtagacatcc attttctctc actctactct tagagatcgt    2160

caagtgtcac atacatttct gagaactagg actttgcata gaatatgcat cggttaggtg    2220

tttgcgtaga gagtacgtgt gtctgaggtt agccattgcg cttcgtttgc ggtttacaat    2280

ggggcaaggc ttaaagcttt ttaaagccac ggtgaccact actgcaggtg cattcttttt    2340

ttagtcgtaa aacactaagt ttttttact agttataata gactttctt tccttcttcc    2400

cttctcgtag ataaacccaa ttgaagaatt aatataaagt gtattcttaa tcctagcctt    2460

atccctaaat atatatatat atattgtata ctctagctag ctctatgtag ggctagttct    2520

agtactgcct ctagttagtt aaaagggaaa acccttaaat aagaagaaaa atcccttat    2580

attttgtcag gcgaaaacaa ccacccgaaa acgacggatt tgacgatgac actaacaaca    2640

aagctaacga atttgacgat attagcaatt gaacctagat atcgggatct aggtctgcga    2700

ggtttccgat ccacgcctag gattcaagct aggggtagg gtcttttct aataataggt    2760

tattttatta attaaacaat ccaagcctaa ggcaacgaag ggagagtaaa gtttctattt    2820

aaagggaggg aatctagggg ttttatctag ctaggaggtc acatgactag ggatccgatg    2880

tggccgaatt gatctgacaa gccaatagat ctgacgaagc caaggtctag gggcccgagg    2940

tcttgtgaga gaggtctcga gaggtcacaa tgctagccac acaatatcta tcaatatatg    3000

aatatattat attatatgat ttaccctaga tagcaattta tgccattaac cagtactcct    3060

gccgtgatgt tgctttgtag taggaaaacc atactaggtt gctaattatc tagataacta    3120

gataactagt tagttgccta gttagaactc gtatctcaaa tccctgttac gtatctctct    3180

acccgcagtc cttttagat cttgttattg agtctcgtag aagtagcaca tccgcgctac    3240

ctgcagctgg accagctatg agactgacaa aaaacatcct taccataact cgtaagctca    3300

agtgtttatt ttctgcttca agtgcttgag aaaatagccc cacggtcaag aaaaatccac    3360

ttgatgtacc agtcatctca ttaatctgtc tgagtctagc atgtcgtgca gcgatctcgg    3420

aacacggaaa ctgcgagcaa tcgggtacac caaggaggct attccctata tgaaagggag    3480

cagtggcgtc tctgtgaagg agagtcgcca cgatcgctac cataaaaatg ccaatgtggc    3540

ttataccagt gcaccagaaa atagtcctta ggaaagcctt ctcttgcctc ctcggccacg    3600

ctgttactaa tttctcggca cgatattgat ttaggatcca cagtgaaaag acgggaaagg    3660

cagtggaaag tccaactgtg taagagagat agcctagtgc ggccaaactt cttcaaaaag    3720

taagcatagt cagtgagtca gagttaacag ggaatcacat actcaaactt gcggaggaat    3780

gcgccatgcg gtacggtctc atgcagaatt atcaaaatga gcccaaccag ctgagcaatg    3840

taaagcatta ggtgaagcca aaaccaaggc ccattatccc aaatggactg catcgacgca    3900

acagcgcgaa acccgaacca tggtgatgtg gttccatagc ttaatgtagc atccgaagaa    3960
```

```
tcaatgaact gtaatgggca gggaaagtca atgatcggat atccttcccg tgacttccat    4020

attacgccgg ctaaacaaaa gaaaccctgc agagagataa agatccaatc acttcgcgac    4080

atagggaaaa atagaggaaa actgataata actttaggtc cagtttcatg caatattggg    4140

aaaggccaga agcataatcc gtacaatcgt catgatatcg tcaaagcgag actaagctgt    4200

ttctttatag gggctgagaa atcttggcaa taggaaaccg gaagaatgcc gagtgcgact    4260

gacgcaaaga attggcttga gcacccgacc ccctctccat ccctaacccg tgtcgtcatt    4320

atctttcggc aatagatatg gcgtttcatt tcactgtaac atacagatta ctccgtattt    4380

atgtaataat acaccctatt acatgtaata ttacacgtag ggagggggtg attaggaagc    4440

gtgcggatga tacgtagaac tactatataa ttaactactc cgtatagata gctagtatta    4500

gttattgtaa aggtaggggt caatatagat gattaaaagc gttcaattta gtcaattaga    4560

ggtgcagaca gcacctgagt tttgtaccta aaaggtacat agtgcgctat agtaatgact    4620

agtttacgga ggtacttcta atacattgta tccactcgtt gtcttagaga gagtttttatc    4680

ctagtcaatg cgcgctgcct catacatcct aggctttaag ggagctctcc ctgacagtta    4740

ttgcagctac cttagctaca ttcaggggtg ctatttacgc ataagggtgt gcttaataaa    4800

cacacccctg tcaataccca agccacaata aagacagttt ttgtctttgt gcagattcgt    4860

gaatcctact aaagcttaca gacacatgca ataccactaa taaaatattg atttggagtt    4920

gttttggagg tggattttag tataggacta taaccactct cctatcttac atcagaataa    4980

acccaatttt tgtggtctag acaaaacgta atgctaagca aaaagtggag agcttgcaaa    5040

agccagagag aagacatggc gccataacta aattgatcct tgtatatctg atgcagttgc    5100

cactgcgtga gagataaagc aagttaatcg attagtatcc gatcaaaact tttcgttcta    5160

ggaaagcttt atttcgcaca catcaatgtt cttggaatgc taacccgaat cgcaattatc    5220

tgaaaccatg actagcgact tcaaggtaat aatcgtggga ggatcagtgg ctgggctttc    5280

actagcccac tgcttagaaa aaatcggtgt ttctttcatg gttctagaga agggtaatca    5340

aatagctccc caactcggtg cctcaattgg cattttgcca aatggtggac gtattcttga    5400

tcaactgggc atcttccata gcatcgagga tgaaatcgaa cctctagaat ctgctatgat    5460

gagatacccg gatggtttct ctttcaaaag tcaatatccc caagctttgc atactaggta    5520

ataacagtga aagaagagtg gcctataagt gttcatatat cgctaacttc gtgcggttaa    5580

tagttttggt tatcccgtgg ctttccttga gaggcaaagg tttcttcaga tactttatga    5640

taaactcaag agcaaagact gcgtttttac aaacaagcgg gtagtcagta ttgcaagtgg    5700

ccaagacaaa gtcacagcaa agacttcaga tggcgctaag tacttagcag atatcgtgat    5760

cggtgctgac ggggtccaca gcatcgtcag gtcagagatt tggaggcatt tgaaggaaaa    5820
```

```
ctctcaaata tcagtattag aggcaccgaa cgcaagtagg ttaacctagg attaattgca   5880

aagaaacttt actaatgagg gagccactta ggtattaagc atgattattc atgcatttac   5940

ggaatttctt taaacgttcc ccagatcatc ctaggaatac agttaaactg tttagatgac   6000

ggagtgtcaa tacacttgtt tacgggtaaa caatccaaat tattttggtt tgttatcatc   6060

aaaacgcctc aggctagctt tgctaaagta gagattgaca atacacatac agcaaggtgt   6120

atctgcgaag gactgaggac gaaaaaggtt tcagatacct tatgttttga agatgtatgg   6180

tcaagatgca ccatattcaa gatgacgcct cttgaggaag gggtgtttaa gcattggaac   6240

tatggccgct tagcatgtat tggtgatgct atccgcaagg tatgtggatg atgctatatg   6300

tccctatttc gtgtcatcag tgggatgaca aaagaaggcc actatttgcc gctaatataa   6360

atgatcgtat cgctaacatt aacagatggc cccaaataat gggcaaggag caaatatggc   6420

gatagaggac gcttgcagtc tcgcaaacat cctccagaaa aagatatcac atggttcgat   6480

tcgagaccaa gatatcaatt caatgtttca ggaattctct atggctcaac gggctcgcac   6540

ggagagcgtc tgcgcgcagt cggagtttct agtccgcatg catgcgaatc aaggtattgg   6600

aagaagactt cttgggcggt accttattcc tttcctgtat gacgcacctg ctggtttatc   6660

tggattttct ataagtggcg caacaagaat agagttcata gacttgccca ctagatctct   6720

taggggagcg tggggaaagt catggagagg gtcatgggaa ttcatcctac aaagcttggt   6780

ctatttgcga cccaagttta ggatagttta tgccttgtat ctcgttgcag ctgcagcttt   6840

tatcttgtat tgtcttagca gtctcttccc gtagcaagga acaactgtcg aaaatggcct   6900

taatctggaa aagctaatgc ggcgatgaag gcaggcagaa ctcaaaaaca gacaagcaat   6960

gaccctcata ttgttaaatg ctagttgtta cataacttca tgtgattcga ggtgaaacta   7020

tattaaccca ttttccaact aggagaaaaa tgtgttatag aaaagtaagc aaatagctag   7080

taagaatata ataaaaagct agacatgaac ttatatttcc aacagcaaga cctaggtata   7140

tagtaactaa aaggtattac gaacctaaca tatactaata gtatataata gagtagctta   7200

tgtagaaata taagtaaaga aatagcaaat aggtaaggaa ttaataaacc taataggcca   7260

tagtagcacc atttagacta aacacaatat agttagctat agttatgtag tcataactaa   7320

gaattcaatt aagtaaacac ttagtaagat agtaataagt tactatagag aatatagagt   7380

ctatatcctt atccttgttc atagtgtcta taagctccta gagctattct agaatagcaa   7440

aacgattagc aaaattgccc tcaagtgtaa gaatagccta gtgtaaaaac catagcgtta   7500

agaaactata agactagtaa aaaaaaggga gacttgtagt cttgcaggta ttgcctctct   7560

tattcacta gatatagcgc tttaaagttt agtcttagct agagtagaaa ttaaaaccta   7620

atggaaactc aagttgattt atagtaatat agccttaata aggggttttt tttaaagtcc   7680

gtgtacttag tatgtaaata acacatatag ctacactttt caaaggaaat tgtagttata   7740
```

Page 37

```
ttagtggtaa aacggtggta aatagaaggg ttaaagaggg tatgaactaa gcttaaaaaa  7800

accctaggaa agaaactagg tttatatggga gaaaaaccta atcaggcaat agggaactgc  7860

aagtaaatgt tagagatagg atacttacaa aataaagggc taggaaaact ttagatcctt  7920

tagataatta agcagctagc tagctatggg atagctatgt gtttataaag caaggtattt  7980

agcaaagact acttatacta tatatagtaa attagagttt aagacctta cacacctact  8040

cctaggtagt atctttctag tagtaactac gaatcttagc cttcaatcta ttcattaccc  8100

tataaccgaa gttataacaa atccttaaat ttttaataag tattaatcta tacttaacac  8160

atataagtac tatatttatc aagtattaat taacactata aaggttataa atataaattc  8220

tacttataaa aaggaaatat atcttcttta aaataagggc taattaatta atttaatgac  8280

gcatgaaaat attattgtta taaaggaaaa ggggggatta tttactaccc cttaagttat  8340

ataatcatgc gttgttagaa atattaaagc ttctagtgta aaataaaagc taagtgcaac  8400

taagtgtaat taaaagcact aggcttataa cctataagat agtggaaaaa gtaataataa  8460

taaattcagc tatctaagct ctttatatac gtggtataat aaggctatat aacgagagca  8520

aaagacagtc tttaccctaa gtgacaaggt ctcgtaatta gccgcgaaga gggaaagcat  8580

cgcgatgaaa gtgatgccta agatgtgagg ctgctacatc taacagatca gacccttcgt  8640

ctcctcagaa cacgcggttt gaaaagttct acctctagca actcctcgca ccaagctgtt  8700

tctacatgct cttaccgcaa tctaaactga aacccaaaat tcacctcgca catagcccct  8760

aatccgcaat tgctttaaca tgcaatacgg taatttaaca actgtattac ttctgcgtaa  8820

tactttattg tccttgaatt cttcgtcaat ctgccatgtt cactggctgc aagtgattgt  8880

ggctctgctt gtcttgatcg tctgcatctt tctatattgg cgaacaccca ctggcatcaa  8940

tgctcctttc gcaggatatc gttcaccatg ggagccgccg ctcttggttc agatgcgtta  9000

cgtcttcaac gctgcctcaa tgatacgcga aggatatgct aaggtatgtt ttatcccgcg  9060

tagaggtctt ctacccggat agaccgagaa gataacaact tcggaacagt ggaaagactc  9120

cttgttccag atctcacgat acgacggtga cattcttatt gtgcctccaa gatatttgga  9180

tgacctccac aacaagtcac aagaggagtt aagtgctatt tatggtttga ttcgggtgag  9240

gaatgccacc aaccaaaaaa cgcagagcct attagcgcat ggtctcacat attcgaattt  9300

gctagaattt tggtggtagc tatagcggca tcaccctgct tggagaaaac gatgttggca  9360

ttcgtgcgct tcaggtatgt acacccttcc aaaagtctgt tagggacctt ccttactcta  9420

ctacagacaa aaatcacccc aaatcttgcg aaattatgcg atgacataag ggatgagttt  9480

cagtattgtc tagatacaga cttcccagcc tgcagaggta tgccatttcc aaaatcccat  9540

tatgcagtct ctactttttc tggcactaac gatatctaac atagattgga catcagtgtc  9600
```

```
cgtgcatcca ttgtttctaa aagcagtcga aaggataaca catcggattt ttgttggatt    9660

gccattatgt cggaatcccc aatgggtcca agcgaccagc aagcatgcac attacggtac    9720

gtcaattgac taataatagg caatatacgc gctcatatgc tttgcagcaa caatgataca    9780

gatagctatg agatctgtcc caaagttcat tcagccttta ctaaattttt gccttccgtg    9840

gccatggaag aacgcagcct gtgttcgtga agcaaagaat gcccttatat tagaaatgca    9900

acgccgacga aatctcgaga aagttaacag ttttgattat atcaaatcca atgacttgct    9960

gcaagcagtt atggaaatgt cttctcctag tcatgaggat agccagcttg atgttgtcgc   10020

ccagataatg ctcacgatga acacaatcgc tggccacagt actgccgcat ccggagcaca   10080

tgcactgttc gatatggtta gccactctaa gtatattgaa ttgctgcgtg aggaggctct   10140

tcaagtcttt cgacatgttg aactgcgtgt tacaaaacag gctttggggg atttgcgaaa   10200

attggacagc ttcctcagag agttagtatt gtcctaaaca tcacaatctc accacattct   10260

cacgctagct tttcctccgt actaatgatg gtcgttgcta agatcccaac gacataatcc   10320

gctaagcttg tgtatgttta gctaagagtc tcgaaaacct ggaaatgttt gtcctgtgcc   10380

cgagttctaa cgtctcttac tacagtaggc ttttttcggg tcgtattaga ccctgccggt   10440

atcacacttc aagatggcac acatgttcct tacaacacac tgctttgtgt cgcaccacat   10500

gcgatatcca atgacccgga tgtgatagaa gacccaacct cgttcaacgg tctgcgatac   10560

tacgaacagc gctgtcgtga cgccagtcaa gagaaaaagc atcaatacgc tactacggat   10620

aaatctcacc tgcattttgg ctacggaacc tgggcctgtc caggccgctt cttggcctct   10680

gatatgttaa aagtgattct aacgatgctt ctgcttcagt atgacatccg ctcccccgag   10740

agagcaaaac ggcctgtggc aggtcatttt catgagtttc cgcttttcaa tattaacaca   10800

ccactgttaa tgaaacgacg caatgattcg ctagttctat gatttattgt gactttcgtt   10860

agcatattac atagtgcgaa acttaatcta gaaaactaga gaatgaatat ctttggcact   10920

gtcatgcatg cacgccttaa catcatattc atttatatta ttactaatgg cctagatctt   10980

atttacttag tgaaactagg ggaacacatc actttctttg tcctagtgtg gttttaaatg   11040

ttattctttg cgtacatttc catatagcag cccgtttagt aaccgtattc accttgccta   11100

acaatcgttt tctaataaca cgctaagggc aacaagtgac aagtgtttag taattagtaa   11160

gcagtttagg ttaggggggag caaggtagtg taagcgcagg gcgtgcggtt tattataata   11220

gaaaagaata tagtattagg gttaacacta gaaaaatccc cctagcttat taagtaagga   11280

aatagattag ataattatag tagtaatatt tatagaatcg ctctagctag cttaagtagt   11340

aattaaccat catcattacc taatcatttt ggtactatta caggcctttc cgtacagcca   11400
```

```
<210>   24
<211>   11202
```

```
<212>  DNA
<213>  Neotyphodium lolii

<400>  24
atttatgtct tttgcagcgc tgtcgtataa ttaagagcaa ttatggctcg ttgcagcaaa     60

caatcgccca attgatacaa tcaaaattcc acaagcgaaa gttgtgacaa ctcacgtcct    120

atcactcctg tcgtttcctt tcaacatacg gtaactgtct tctccaagcg gcgcaaaaga    180

acaacggcat tccgattggg gaggatctta tccccatgaa caatgttagg agggcgccgc    240

gacggaaact cactatctag cttaaaatca tactcgagca gaatccgact catgattgct    300

ttaatcatat actatgagca caaactcaag ggttagtcaa gaaggtcgaa tgtgcgtcac    360

atgagcttga agggagattg atatggaaaa aaaaaagatg aaaatctaca tcacatacgg    420

aagctatgaa gcgtcccgga caggcatatc tcccaaatcc gaagtgcaga ttcaaggcgc    480

tgctgttaga aaatgatgtt gtggcagtgc cagattgttt caaccatcga aaaggttgaa    540

acaagtgagc gtcggataat ttcgtactgt ccgtattgat acacttcgct ggaatcgcaa    600

tctgctgtcc cggctgtagc tggtagccat cggacaatgt aattcgttct cggacaatgc    660

gtctaaaagt gacttcaatc gccagttagt tccaagtttg acaaaagact ggcttagaat    720

agtccttaca ctcgcccact ggattgattc gttgtgactc tctcatcagg ctatccaatt    780

gtttcatatc aagcatagtc tgttgcgtga tttccgtcca accatgcttg agcacgtttt    840

gctgttctct tcggaggctc tccttcaagc tgtcgtccga gatcatgtca aaaagtatgt    900

gagttaacgc catagctgtt gtatgaatga cagccatgct caatattcct agcgtacgat    960

gcgcaagtgc ttctggccgt gcttcatcct cggtgactgc taactctgta caccactgca   1020

aaaagtcgtc gtgctttttcc tcagagttaa gtttccttct ctggacttct gaaccaagga   1080

ggttttgaat gtattgtaat tgcccgtgag cttctttcgc tgtggaaatc caccgtgcga   1140

aataatgtgt gaacaaattg ccaaaactac gggaggtgga tatcgtatca aacgtgttgc   1200

gactaaaaga agcagtagtc tcgagaaaaa tttcgtttcg acaaatcagg tctccaacga   1260

atagcctcgc tgtagcacgg gtagctagat tgagaaccaa ttcgtatgga ttgacagaaa   1320

tccaagcatt ggaacctcca ctaatattag acaacactag acaagtggaa tgtttgaaag   1380

aatgaaaaca cataccgtcg ttgccggcag gtaagacttg cccaaaggca tgattgagct   1440

catccaatag cactggaaga gtttgtgctg gattcagtta gcatagtgca aacgtattct   1500

gttagattac acttacgaag ctttggagtc aaacgctgct gtatggcacg tgtgtgaagt   1560

tcgctcccta ataatatcct cgtaacttta ccagcattgt catcaaagct ggctgttaaa   1620

gggtctaatt tgtcgctcgt aaccgcccgt aattccagcg cgtattgtaa aggaatgaca   1680

atcagatcca tgtccatctt aagtagccta aacggttgat ttttgtgctg taacctaggc   1740

ggttagtact atcatcacgg atgctcacag acttgggacc gaacaccttc tcatagccat   1800
```
Page 40

```
gtttgactag gcgggcggca tggtcattat aactcagccg atcgaggaat tgggggagta    1860

atcgaggcca acgtcgaatg gttggtatac attctttccg tttggtaccg taaacaacgt    1920

accacagtag taaacagata cccactggga cagcgtgcaa cattaacatt ctcaagagta    1980

gctgatttga cttgaatgga atataaaatg atttatgaat taattttgaa tgggcttggc    2040

atctacagaa taaaagatta taagacaaat aagacaaagc ttaatgttaa aactttatgt    2100

taagtacttg aaattgtcct aagccatcga atctaatgca acgcctgtcc tcttttctct    2160

tgacactatg taaggagcct gcagcaataa ctaaggatgt gatccaagtt agcgcagtta    2220

tttaaaattc gtcattttta gacccactag cgccttccta tatttagaca gtattttacg    2280

gtatataacc tagataattt caccettgct tataatacaa tacaatccct gaattgtttt    2340

acaaatctat ataatagaag taattgagct aattaaatta tagctaggaa ataaaggaga    2400

cagggggtgg tatattttag tactagaacc tgcatagaaa tagatattct cttttgtgac    2460

gctatatacc ttgcatattt cccttgtagc tctctaataa taggattact tatagctaat    2520

cacagccgtt agggaggaat caataactag ggcatgtaga cttgtaaaat aattcagcgg    2580

gtagagtgtg tacttaaatt acagtggtgt tacaggggct atttagatag ccaaaagagg    2640

gaagccctat ttctgacact ggcgtagtaa aaaaaaaaag tgcgctaatg tattacttta    2700

ttcttacgga ttagtatctg atcctattgc aggcatttac ttggcactag ttgaaaagat    2760

atattataaa caggggggag tggtttatg caatgtgaac aaagtttcac aaatttctac    2820

tccgtataaa cataatttat tggggggtctt gacatgtccg tcttagccga caaccccacc    2880

atgccacgaa tcccgcggag accccaatca atccatacac ggcacttaca cagatcattc    2940

catccgccca agtaccgtcc tatactccgt acaccctaaa agccttagag cacgaacata    3000

tgccgttgtc tccctagtca cacacaagat gcctacccccc cttcccgatt ccccttctca    3060

catgtgtaac gtatgtaacg caaggttagg tcgcggtggc acaaaaaagt aacgccgcag    3120

ccgaaagcca tcctgtcgcc agcggaggtg tcgcggttcg tatctgctta gctgtgtttc    3180

attgttaggc gtgtgcataa tgcgcggggt gcgtttaaat gtctagctga agtcatatct    3240

gttgccgtgc atcacatcac ttttacttcg ggcaccattt catgcaccct aatagccacg    3300

acacacagaa tccatcacca attaactcag gcagttcgca cctacactaa gccattcgaa    3360

caatatacat tacttcaaag actcacctta ggccgtcttt tcacgcagcc aagaagtttg    3420

aacagctcgt tcctacatcc ctgcgaatcg gacgtttttc acggatagac cctctaggcc    3480

cttaatgaag acttctaaat gtcaggagct atctaagtca agtacgttga caatacattt    3540

ctttggaagt gttgtcttcc gttttcttat ccctcttatc cctttagcct aggttttcta    3600

aagttaaagt cgtcaagcta ggttcgatat gaagatgtta acagagcatt ttgactttcc    3660
```

```
taaacttaac ttcgccacca ttgtaatttc aggcgccacc attattggta taatattcct    3720

tcgatatctt aattacccta caaaggtttg aatctgtttc ccttgctatg cacttttctt    3780

ggatgctcac caaaattttt caaggtgaat gtacctgttg ttggcattgg agttcgatat    3840

acaaaatggc tagcggctat tataaacgtg cgtcatgctc gacaatctat ccgcgagggc    3900

tatgcaaagg tttgtgttaa aaacgaataa aagcgcttcg taaacaaaga gaactaatac    3960

tagtttctag tatggcgatt tcgcgtttca gatacctact atgactcgaa tggaggtatt    4020

catttgtgat agacagatga caagggagta tcagaatgtt gacgactatc atttgtcgtt    4080

ccgagctgtc atgaccgagg taagtaacta gaccatgtta actgtaggaa aagaagaaaa    4140

agctaaaccg ccgtacagga gtttcaattc aaatggctac ttccaggaca ggcacacgaa    4200

gcccggatta tccctaactc agtgattgct aaggccttga gctggcagag aacaagggcg    4260

aataaaccca gcgatccatt cttcgaatct ttctccgccg aattcatgca ggggtttcag    4320

gaagagatgc gacgactaat ccaatatcaa aattcgtcag ttatgtcaaa ccgctccggt    4380

gctgtcctgg atccagcgca tggttggcat gctgtgcctt gttttccctt ggctctgaag    4440

gtaattgggc gccttactac atacgtcttg ttcggcaaac ctttgtgcca agatgcgaca    4500

ttcctaaaca tgtgctgtca atttggcgat gtgattccca gggatgcgat catactacgt    4560

tcatggccag cattggcaag gccgtaagca agtgcctaga cataaacccg tcagggttta    4620

aactcgcatt aacattcata tagtcttatt gtaaagatct tgagtgctcc aagggttatg    4680

ggaaagttgc gaaacatttt gattgttgag ataaagagca ggagagaatc ccacgaaacg    4740

aacccaatga gtgtatggct gtctcgcaca ccccctctag cattacacat taacgtatat    4800

ctaggatatc ttggatttca caatggcctg ggttgaccgt catcctaacg ctagctttga    4860

cgatcagcac attgccgaga tgatgattaa cactattttc gcagctcttc atacgtcgag    4920

tcaggtatat ttttttctgt atgaaaagtc cagagcttaa agctaactgg ctcatagctg    4980

gtggtgcata ccatctttga gcttgcctca cgtcctgaat atagcgatgc gcttctggaa    5040

gagatagatg catgctttga aaagcatgga aagggcacta aagcagctct agactcaatg    5100

ttcaaggtgg atagtttcat caaagaaacg cagaggttta accctcttga cgcatgtata    5160

aattccctgt ctccgattcc atcattgcga tttgactaac gccaccgtca gccgctcttg    5220

caagactggc tctcaaagac tttacttttt ccaatggcct aaacatccca aagggcagtg    5280

tgattttcac gccgaattcg cctatctttg aggacgagag atattacaag gatccgaaag    5340

tttttgatgg atttcggttt gctaggatgc gtaatgaccc aaaattaggt ctattctgcg    5400

acctaacagc aacgaatgaa caaagcatgc attttgggac tggacgtcac gcctgtcctg    5460

gtagatttat ggtttctgat gaggtcaagt tagctgtgat tcatatctta agtaatttcg    5520

attttgtat tgagaatttt ggaccacggc cagcaaatca gccatttggt aaatttcttc    5580
```

Page 42

```
tacctgatat gagtgcaaaa atctggctaa gggagaaaag agctagggag aagaatctgt    5640

gaaagccgtt aagataatgc caattgctac acgatacata tatgttcatg ttagcgagtt    5700

ttgaagagaa gctttgaggc ctctaagaaa ttttaactac ctatgataat gaagcagctt    5760

tatttctaac atgatttttc tagcctgtga aaagtgattt ttgcagctta gacaatagga    5820

tacatgttat tagcctacct gaggggggcta tggtaagtga ctctaagatc tcgcaatatc    5880

aatgaaacta taggcaatat ctagctaatt aggcctatat ctatgcttac aaatgcagta    5940

ttacctctaa gtctatagat aacaagcata cagctagttt cgtttcatta cgtaacggtt    6000

tgtctctaag tagcgacagc taagtgagac agatatatca ggcacaatac aatacacccc    6060

ctgagttctt ttacaaatct acatgcccca gttattcgtt cctctctaat agctatgatt    6120

agctatatgt aatactatta ttagtgagct ataagggcaa aatacaaggt atataacgcc    6180

ataaaagagt atattttttt tttctctatg taagtgccta gtacaagaat gtactatccc    6240

ctattacctt catttcctat ctgttatcta attagcttaa ttacccctgt tatgtggatt    6300

tgtaaaataa ttcaggggggt gtattgtaca tcattccaat ccgtcttaaa tcatagatat    6360

atgctccttg ggctttcgtg ccacacccccc ataagtacaa atgcactgtt cacatgtttc    6420

acagcctttg attgcctaga agagacgaat aggtataata gtgcacatat tgccatccac    6480

ttaatgctaa tatccctttc gctcgctctc tttatctttt gtggacgcag gtcctatttt    6540

tcacatataa gcacttccga acctgcgtaa aatcttactc acgcaaggaa atacaattca    6600

aattatatcg tgcttgattg atctctttct aggcttcctt ttgttcaaga gactaactaa    6660

caattgttgt cttcggctct cacattacac catgattgcg aaaaatattg aactcaatgg    6720

cttggatccg gcaaccaggg cattggacat tctatactgg aaaaatcact gcatcaaaca    6780

gctagaatct ctcctatgcg ccacagattc atactgcact gcagacaagg ccgctcaact    6840

acgcattttg tcagagttgg tgctccccaa tcttggccct cggccgtcca atgccactgg    6900

gccatcctat cttacacgaa gtggttcccc aataatgtta agtctaaata caacatcatc    6960

aaaaaactgc gtcagatatt gctgggagat tctaggggcg actggcgcaa gtaatgatga    7020

tcctttggca gtccaagttg ctaaggatgt agtggcttct ctgtctgcta cttttcgcct    7080

ttcaacaaaa tggagcgaaa ctctactgtc caattttgca gtaacaccag accaagctcg    7140

acaagttatt aacatgctac ccgagtggat tcaaggcttc gtacctgagg gaatggagtg    7200

cgattttcca aagagaatcc cgttcgccat gacatcattc gacctaaatg gctccaatgt    7260

agctatgaag ctctacgtta atccaagggt aaaggagatt ttaactggta ctccctcatc    7320

agacttggtc tgggagttcc tccgaaattt aacaccagaa atgaaaccac gagcggtcga    7380

cttgcttgag aggtaagaat ggctttgaac tttcgcccac cttgtcagcc ccatacgcta    7440
```

```
agcgctaact ccccacacat taacaggttt attaccgata attcaggccc gtctgctatt    7500

gagcttgtag gtattgactg cgttgacgac gctcacctat caaatgcaag ggtcaagctt    7560

tacgttcata ccatgagcag ctcatttaac accgtaaaga attatgttac tcttgggggt    7620

gcaatctggg atgaacaaac ccaaaagggc ttaggaatac tacaaagtat ttggcaccta    7680

ttgcttcagg agccagaggg tatttctgac aatggattcg acaagcctgt gaacgactct    7740

tccatgttat gccaaaagct atattttagt ttcgagctac gcccaggtac agacttccct    7800

caggtgaaga cctatgtgcc aacttggaac tatcttcgaa ccgacgggga aactatccag    7860

aactatgagg cgatcttccg agcttgtgac catccttggg gtgaagatag gacgtacggc    7920

aaaatttttc aagatgcatt gtaagttatc ccttcagatt agcgctaaaa ggagtttgag    7980

atactcctca atgcaagcta ttaggttgtg aaattgccac tactaattgg agctttttat    8040

agcggacctg caaccgagag tcggaaaaaa cccattcact gcgacgcatc ttttctgttt    8100

accgaagaaa ctggtgtcta ccagacgctg tatttcagtc ctccgattga gggggaaaca    8160

gaagtccagt caaatctcgt tgcttgaggt tgaattaact ccgcaatgct acgtctaaaa    8220

gaagtgtctt tggtgaacag atgatagggt tcccttgatc tttcatatat ttgtgtacag    8280

ctgtggaaat ttagggtcta gctctagata aagccattgc ttcaatcgtc atttgacgta    8340

ttctgagtct tgagctattc catatttttt ttctaattaa tcttgacttt attaagtgtt    8400

gtaggccgtt gcaataatat ttgctttgat cttacaagtg tagcagctac ccttgcactc    8460

ttcgattctt gaacgagcgt tgctattcgg agctgtgttc aagaactagg ttgtgcgcat    8520

aggtttaatt ttgcaatatc acgaggagag gcccgttagc caactgctta aatacaggtc    8580

ttgctagaaa atggttgcct taatacagct gctatgctac ctcctatctc cttaagcgtg    8640

ttctaccttg tgggtctagg ctttggtaaa gggtagttat tacaggcaag agatgtcaca    8700

tcaagatagt ttttgtctag catagcgcgt gagttacatt tctccgaaat cattttgtaa    8760

agtgcatttg ttctttttcgt ccccagacgg ccaccaagtt ctctagaccc tgacctgcct    8820

cctggagcgt tttgagacac gtgtttttaa cactaggtga ctctaacgct tggagtgccc    8880

gtttaatgtc gccttgattt tggctctgaa acgccttcct tatctgcggc tcagtatgtt    8940

tgtcattaag agcaaccaca acaggaaagg acaattctct gttgcgtagg tcttctgcaa    9000

cagtgccttt gttaaaagcg tactcttctg agtatatgtt cttgcaatca ttttgcaatt    9060

gtgcgtacca gctaccattc cattgaatta gttaagcgac cttgccgcgg aattatgaaa    9120

cgagcgaaaa aaaaaaaaat ttacataccc aaatcggcct aacagatcgt ctgattgatg    9180

acctccttgg ttcaaaagcc tcccaaggag cacaaaaagt gtgcctgtct tcagcagagc    9240

catatttttg tacgtcaaca ggctttcttc accataggat tcgaaagatc gcaaaccgtc    9300

tcttcgccaa accaaagaca tgtcttgtcc ctcgagtatc agttctagtg ctctcagaag    9360
```

```
ttcaattcca aggacaggtt gttctttcat tgctctatta atgacctttg tgagaacgaa     9420

gtatgctcga ttggcagttt cgcatgatcc gtatagcaag tgagccgtag tgtgattttt     9480

ccgcttaggg ctgtggtcgc aaatatcgtc aaccataatt agacaaagat ggaccgcatc     9540

catgatatcc aggatcaaag aatgtttctt gggatattta tgtttcaatg ttggatgaag     9600

aaaatccacg aggggagaga aatgattatg cccatagaga ctaatcacat aagagtatgg     9660

acagtcagga atcttgccat tgctgccgcc aataccttcg tgagaggtac gttcatagcc     9720

atagccataa tgatcaatgg cttgagaaac gacagattgg taattgattg tgtactttac     9780

tagatacccg agcgtaaatg caaacaagag ggccgcaatt tcgatggccg cagggcgagc     9840

cacgagccat gctccagatg tcatcttgga atagtgatgt acgtcggcta aaggcagatt     9900

gccttgagaa agaattcagt taagcaaagt tttatcaatt ctcgcaatat atgcagagca     9960

actcaagcaa atgttaggaa tatcgttaga ctataattat agaggcagag cttctagaat    10020

agcgcaatca tagtctatta tgtatacgcc caggcgcggt taaatacata catataattc    10080

aacgaccttg tcaggcaatc aagatgtgct actcttaatt acataatgaa caagatgcta    10140

gaggtattaa aggccaaaat gtgtccttct ggatagcaga ccggactaaa ccttcgcaaa    10200

ccattcctat aatactagct gattttatca ctatggacgg attcagcaat atggagcaag    10260

cgccgctcgc ttatcaggaa gttcaatggc tagctgaaac ttttgtcact ttcatggggc    10320

ttggctggct tatcaattac gtcttgatga tctggcactc taggaggggt gaaccgagca    10380

gcatggctct catacccctc tgcaacaaca tcgcctggga gctcgtatac acgattatct    10440

atccgtctcc taacaaagtg gaacttgcgg ctttcatagc aggtgtcact ttgaacttcc    10500

ttatcatgac ctctgcagcc cgttcggcaa gatccgagtg gagtcactca cccacaatgg    10560

ctaagcatgc aggtttgatt atagtcgcag gaatattgat gtgcttcacc ggacatgtag    10620

cattggcgat ggaaatagga cctgcgcttg cttactcatg gggagctgtc atatgccaac    10680

tagctctaag cattggaggc gtgtgtcaat tgttgcagca gcatagtact ggtgggacat    10740

catggaaact ttggtaagtg aataaatcaa ttacgtttct aatctatatt gaatgtcata    10800

tcaggggtgg ctgacatgaa agttttcagg tcaagtcgat ttctaggctc ttgttgtgcg    10860

gttggctttg cctttcttcg ctggagatac tggcccgagg cgtacggatg gctggccagt    10920

ccccttatcc tctggagtct tgccacgttt cttgtggccg atttgacgta cggggtttgt    10980

ctccttcttt aggcagaaga gaggacagtc gaactccact aagcttcaga ctgcgcaacg    11040

aaaacgagta acggcttgag actagttcta tcttatcgat cgctatctta catggttaat    11100

gtaaccttct atctttgtct aagggcttac actcaaatga aatcatacat gcaacttaaa    11160

ctatcataca taggagagtg ccaatttaag caatttaagc ac                       11202
```

```
<210>   25
<211>   6583
<212>   DNA
<213>   Neotyphodium lolii

<400>   25
aagctttta  ccctaaatta  tagtataaaa  aagcaaatct  ctcttagtaa  gctactttat    60

aatattaata  tatatatact  attactctta  attatctagt  ataataataa  gtaaataatc   120

tagattacta  aatatataga  aaaaaggctt  tagactagcc  ttaagtacct  taatataaat   180

taaatataga  tttaagaata  atatataata  ggtaatatta  agattaatta  aataaaaacc   240

ttagagatac  ctatagatag  ctttataaag  ctactttag  gttaaacata  taaggacttt   300

tactataaaa  ttagattata  agaaattcct  atttaattat  aatattaggg  attatttata   360

atctcttcct  atacctttaa  tctttagctt  taataaatat  cttagctagg  ggggtatat    420

taggaaaagc  tccctaaagt  aataaacata  taaatatagc  ctatataata  actaggttaa   480

aacccttaat  aaaataatag  taaagataat  atattagaag  tatctttata  gactagttat   540

tactatagcg  cactatatac  cttttaggta  taaaagttag  gtggtgttta  cacctctagt   600

taaccgaaat  cgaacctttt  ctattatcta  caccgacccc  taccttgaca  gttaggactc   660

ttgttcctgc  aggtcagcta  gcttgagcgc  aaggcaccgt  tgcaccatgc  atgtcatgtg   720

cagcacggcg  catagatgcc  gatgatgccg  ccagtgccta  tcttgaaccc  cagatgcaga   780

ccttgatatg  gcctcttgcg  agtaaacgca  ttgcgactat  acggccttga  agggcattga   840

gttggaggct  cttccctata  atatgtgctt  gtagaattgg  tatcgctgct  tcattttaag   900

cattggaaac  attcaggaga  cgtactacgc  ttgtgtatgc  aacgcttttc  tttttgaaca   960

atgaaaccta  ctactcgctg  tccattcgac  tatctggtga  gccagtgtgg  aaagcatcat  1020

ttcaaaacct  ttgtccagtt  actgtcacct  cttctccaag  acgaagatcc  cgacagatat  1080

gctttaattc  tggacattat  ggacgctgtc  cacttctccg  ccatcttgat  cgatgacatt  1140

gccaaccaaa  gtgctctacg  caggaaccag  ccggccgccc  atgttgtttt  tggggagacg  1200

gaaacggcca  ctagagccta  cctcgttctg  ctgcgggtcg  tcaacaggac  aatgcgagag  1260

aacccagtcc  tggccggtga  gctactaaac  agcctggaag  aaattcacca  gggtcaggac  1320

gagtctcttg  tgtggcgccg  cgacgggctg  gagacttttc  ccgtcgccga  tgacgagaga  1380

ctggcagcct  acgtgcgcat  gtcccgcctc  aaaacgggct  ccctcttcgt  gctcctcgga  1440

cggcttctag  ccaacggtgg  taccgagttt  gatgacctgc  tggtacgctt  tgggtacgtt  1500

tctgcctctt  gtcccaacaa  agagggccgc  cgactaactg  gttctctctt  gttcttgaag  1560

cctgtacgcg  cagctgcaac  atgattgcaa  gaacatttac  tctcccgaat  acgctctcaa  1620

caagggatcc  gtcgctgaag  atttgcgaaa  tggcgaattg  tcctatcccg  ttgtggtcgc  1680
```

```
cttgattgag aacaaggcgg aagggatcgt gggagaggcc ttgcgcacgc gcagcgacgg   1740

ggataccgaa caggcactcc gcgttttgga gagcccggca gtcaaggacg cgtgcctgca   1800

cgcactcgag gctgcgagtg tcggcttgga agaccttgtt gaggcatggg gacgacgaga   1860

aaaaatgaga tccgacaccc tcgacggcga cgacttaaca aggccaagca ccatcacaca   1920

acatgaacaa gatgaccatg ttgatagagc tgccatcgat gccaagagtg atgcgagtgg   1980

cagtagcaat aagtctctca cgcccccaga gacagcccct acgacggaca ccctgtccga   2040

gacagctgtg ggggatatct cgtcagtcga cgtggattac tggactcgga gatgcgttcc   2100

cataatcggt agcctcttga aatcatgccg agtctactcg gaagcggaac gggaaacaca   2160

gctgcgcttc cttcaggaac atgtgctacc taatctaggt cctcgtccat cctcccccgg   2220

ctcgcagatc cagtccatgg ctacattcag cggctttcct ctccaaccca gcatcaacct   2280

gagcggctcc ggccaggcca aagtccgcta cacgtttgaa ccgctcgaca gcctgagtgg   2340

caccgaggtt gacccttttg cactggcgcc ggctcagcga gtgctcgaaa agctctccac   2400

ccttctcggc gtctggcctg gatggatcga cgctttgatc gctgcgtacc acccaaccag   2460

agaggaagtc gagcaattac acccgaatct gcacgagtac ctcagaggcg tcctcgtgag   2520

aacgacagga cgccaagatg tgcaggttcc tcccatgccg cgaatgtggg tgtgcttcgt   2580

tgcgcttgat ctggagggcg cctcacaggc actcaaggtt tattttgatc ccaagatcaa   2640

agaagccgtg actggtattc cttcctgcaa atacacttgt cagattctac ggacggttga   2700

taggtttggc aacgccaagg ccgtcgacat gcttgagcag tgagtcacgt ctgggagcac   2760

tatccaggtc cgaggtacta acaagatttt gtcaggttct tggcagagga gcacagcata   2820

ggcgctgtcg aactgattgc cattgattgc gtcccagaag aaatgcagcc atcggcgcgg   2880

atcaaggtct acgttcacac catgagcaac tcgtttcaga cagtacgcaa gtacatgaca   2940

atgggtggcc gctgcatgga tcctgcgacc ctcgagggtc tggaaaactt gcacgacgtg   3000

tggtactccc ttctcgggga aagtcaaggt attgtcaatg aagagtacag caagcccttg   3060

actggctttg gctcgatgca gcatcacttg tactttagct acgagatgac gcctggcaat   3120

gctgatcccg gcgtcaaagt ctacatacct gtgcaaagct acgcgccaga cgacaagacc   3180

atcgcgcaga actacgaggc aaattttcgg caactcaact ggccgtgggg cgaacccggc   3240

gtttacgaag cggtgataga gagtgctctg tacgtaatga caggcccttt gaccatatta   3300

cttactgaca acttggaatt tagtggacca gtaaagcaca gccgcgcaac gttcctccat   3360

ggaggatctt ctttcatctt ttccaaaggc cgaggagttt atcagtccat atatctagac   3420

cctccactgg aggaaggagg gaacattgct gtattcgagc accacgacga tcaggatact   3480

atagttgacc ttggcaatat gtagtcttgt catcaattga tcagctgtat gagctcttgt   3540

gttttttcct ttagctagtt tggcctgaat gtttgaaaaa catgtctgta tgaactagtg   3600
```

```
atggaagaag ggttgaaagt gagcatgtac cgcaaaacat tattccttca ccttgctcga   3660

gatagctcac cgtaaacgta cctggtgagg tattccagaa ttgagccggt tcattttcgc   3720

ggacatgaac ccatcatcag cttttgccga tcctaaagtc tagacctgaa tagtgacgca   3780

gctggtatga ttggtgcagg acaattactg cgcccacggc ggacgcgatg ccggggggcc   3840

gcccggagac cccggcatgc agaacgatca gctcttgagc tcctacgtcg cgcatgtctc   3900

attcaagcat gcactatata ttgagaccta ctgtatgcag cctcgaatgt aaccgtagta   3960

ttcaaacaag aaacatgcat atatttgcat gatgctttcc gtggcgctgc gcatatgata   4020

tacatggttt acatatgagc tgacttgaag cacggcatag ccggaggatt cttctgcatg   4080

gagcactgta tccggctgaa aattacattg tacgaggtct caatctgcgg ccagctagcc   4140

gagcaccgga gaaccggcgc atctctgctt gaactcgggc aagggactca cttctacaaa   4200

agtcagagat gcataccatc aactgaaatc aagttaggat ttatagcctt tatatttcag   4260

tggcatcact caattacttg tttgaactac gccgtcagag gttcacctac taccagaaac   4320

gacagcacca tggcatttgc aagtcttttg caccatatct ggaaccatgc agtggattgc   4380

gctgagcagc tgacttggtg gcagaccatt gtgagcttca tcattttctg catcatgtgc   4440

tcttggctac ctgggaatgg ggaaatgcgc gctccgtttg ttggttatcg ctggccattc   4500

gagcctactt tctgggtccg aatgcgcttc atctttcaga gtttaggcat gatgaccgaa   4560

ggatactcaa aggtgagctc ccgtccgggt ggagaaagac agctagacga atgactgacg   4620

ccaaacgctt gacagttcaa ggattccatg ttcaagatca cgaccaacga tgccgactgg   4680

cttgtcctct cccaacgcta cttggatgac ttgcagtctc tgccagccga gagattgagc   4740

catacagacg ctctagtgac ggtgagggcg catactagtc gctagtccct acgacagtgg   4800

tgtgctaatc gagttgtgtc tcatttagat gtgggggagc agccacagcc cttttgctct   4860

gctcaacaag agtgatctta gctctcgagc tcttcgtgta aggaccaatc cctccttgtt   4920

atgcagaacg gatctgactt gaaaaggacg tggttgcgcc gaattatgcc aaggaccttg   4980

atagcctcgt agacgaactc cgctattcgc ttgagcacga tatagacata caggatggta   5040

tgtatgcgcc tattttccaa ctaattttga ggtcgtcatg ttggctgact gggtcgatgc   5100

gcttagactg gaaaccgatt gatgcccttg aactttcttc gaagttggtg ttgcggatat   5160

cgcagcgaat cttgatcggc tggcccatga gtcgcgatca agagctcctt gaatgcgcac   5220

aaggctacgc agacgctggt aagaggacga gctgttacgt atgacccttt tcttcggtaa   5280

aaactaacgg gggtttcagc taccgtcgtc cagtttgccc tgaaactact tcctcgccag   5340

attcggccgc ttgtctatcc tctgctccca caagcatggg ctactaaatc gtggatcagg   5400

cgctgtgaca agatactggc aaaggaaatg caacgtcgac aagttttgga gaagtcggat   5460
```

```
cccgtgtacg agaaaccaaa ggacttgctg cagggcatgg tggacctgga gccgtcccgg    5520

cctgttgaca aacttggaca tgattttctc gtccaagcct tgatttccag aatggctcca    5580

gttgttacca tggcccaaac ccttgttgat cttgccctcc atcctgagga tatcgaggag    5640

ctgcgtgatg aggttctgca agtcatagga ccagacgggg cgggattagg aaacctacga    5700

caatcattta ccaaacttga caagatggac agcgtcttga gggaatctgc caggttcacc    5760

cctctatcta tgagtaagtg ccatttctgt cctccagaat agcttgctgg catgactaat    5820

ctgtggtata gtgacaatgc accgccgggt tcaggacgcc aagggcatca cgctccatga    5880

cggtgtgcat cttccacgag gcacgcatgt ggcattccca gcgtaccaca ttggcagaga    5940

tcccaagttg gtgtcaggtg cagatatcta tgacgggctg cgctggtaca ggaaggacct    6000

cggcgaggcc caagaaaacg aagctcccaa gcatcgattt gtcacccccg acagcaacta    6060

cttgaccttt gggtccggta aatacgtctg ccccggccga tttatagcgg aacacatgtt    6120

gaagctgatg atgaccgccg tgctcctgcg ctacgagttc aagtggcctc cgggagtccc    6180

tgtgcccgaa caacagtatc ggcatgtctt tgcttatcca agcaaaacca cactgttgat    6240

taaacgacgc aaagatggcg atcagattct ttaaagtatc attatctgaa aagaagaaaa    6300

gaggatgtct tcctcttccc gttaaagact gctgagtgca agtttgtgaa aggagaggtg    6360

ttacgaacag aatgtacatg cccactagaa cgagttagag tatggcagct accttgacta    6420

atatgttaac tttaataata tataattgat tattaattgt ttttaaatat ttagtattta    6480

ataaaaaata gaatattgta ttttatataa attataatta aacaatatat tatgtttaat    6540

aatataatta aatataaaat acttttattc aagattataa aac                       6583
```

```
<210>  26
<211>  20
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;


<220>
<221>  misc_feature
<222>  (3)..(3)
<223>  y is t or c

<220>
<221>  misc_feature
<222>  (4)..(4)
<223>  m is a or c

<220>
<221>  misc_feature
<222>  (6)..(6)
<223>  n is a, c, g, or t

<220>
<221>  misc_feature
<222>  (12)..(12)
```

<223> r is g or a

<400> 26
caymgnggtc arggtatgga   20

<210> 27
<211> 23
<212> DNA
<213> Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<220>
<221> misc_feature
<222> (6)..(6)
<223> r is g or a

<220>
<221> misc_feature
<222> (15)..(15)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (17)..(17)
<223> k is g or t

<220>
<221> misc_feature
<222> (21)..(21)
<223> y is t or c

<400> 27
ttcatrtagt cgtcncktat ytg   23

<210> 28
<211> 23
<212> DNA
<213> Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<220>
<221> misc_feature
<222> (9)..(9)
<223> y is t or c

<220>
<221> misc_feature
<222> (12)..(12)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (15)..(15)
<223> s is g or c

<220>
<221> misc_feature
<222> (17)..(17)
<223> r is g or a

```
<220>
<221>  misc_feature
<222>  (21)..(21)
<223>  y is t or c

<400>  28
aactttccyt cngtsargtc ytc                                          23


<210>  29
<211>  24
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>  29
gcttggatcc gatattgaag gagc                                         24


<210>  30
<211>  24
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>  30
ttggatccgg ttcccggtcg gcat                                         24


<210>  31
<211>  18
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>  31
tggatcattc gcagatac                                                18


<210>  32
<211>  18
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>  32
gtgtgagatt aagacgtc                                                18


<210>  33
<211>  18
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>  33
accgacgcca ttaatgag                                                18


<210>  34
<211>  18
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>  34
actgggcatc ttccatag                                                18
```

```
<210>   35
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   35
attagaggca ccgaacgc                                              18


<210>   36
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   36
atcaagctgg ctatcctc                                              18


<210>   37
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   37
aaataatggg caaggagc                                              18


<210>   38
<211>   19
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   38
tgggaatttt ggaaatggc                                             19


<210>   39
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   39
gctccttgcc cattattt                                              18


<210>   40
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   40
gtcttgatcg tctgcatc                                              18


<210>   41
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   41
tgtccgtgca tccattgt                                              18
```

```
<210>   42
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   42
catagagcta gctagagt                                              18


<210>   43
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   43
gttcggtgcc tctaatac                                              18


<210>   44
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   44
gaggatagcc agcttgat                                              18


<210>   45
<211>   24
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   45
gattggtacc ttgaagtcgc tagt                                       24


<210>   46
<211>   25
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   46
gtagggtacc tctagtactg cctct                                      25


<210>   47
<211>   18
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   47
tagcgaatca ttgcgtcg                                              18


<210>   48
<211>   20
<212>   DNA
<213>   Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>   48
atggctgcca atgactttcc                                            20
```

```
<210>  49
<211>  20
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>  49
aggccatttt cgacagttgt                                                    20


<210>  50
<211>  20
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>  50
ccagcaagca tgcacattac                                                    20


<210>  51
<211>  20
<212>  DNA
<213>  Neotyphodium lolii; Epichloe festucae; Epichloe typhina;

<400>  51
tgcgtgagag ataaagcaag                                                    20


<210>  52
<211>  2544
<212>  DNA
<213>  Neotyphodium lolii

<400>  52
atgaaaccta ctactcgctg tccattcgac tatctggtga gccagtgtgg aaagcatcat    60

ttcaaaacct ttgtccagtt actgtcacct cttctccaag acgaagatcc cgacagatat   120

gctttaattc tggacattat ggacgctgtc cacttctccg ccatcttgat cgatgacatt   180

gccaaccaaa gtgctctacg caggaaccag ccggccgccc atgttgtttt tggggagacg   240

gaaacggcca ctagagccta cctcgttctg ctgcgggtcg tcaacaggac aatgcgagag   300

aacccagtcc tggccggtga gctactaaac agcctggaag aaattcacca gggtcaggac   360

gagtctcttg tgtggcgccg cgacgggctg gagacttttc ccgtcgccga tgacgagaga   420

ctggcagcct acgtgcgcat gtcccgcctc aaaacgggct ccctcttcgt gctcctcgga   480

cggcttctag ccaacggtgg taccgagttt gatgacctgc tggtacgctt tgggtacgtt   540

tctgcctctt gtcccaacaa agagggccgc cgactaactg gttctctctt gttcttgaag   600

cctgtacgcg cagctgcaac atgattgcaa gaacatttac tctcccgaat acgctctcaa   660

caagggatcc gtcgctgaag atttgcgaaa tggcgaattg tcctatcccg ttgtggtcgc   720

cttgattgag aacaaggcgg aagggatcgt gggagaggcc ttgcgcacgc gcagcgacgg   780

ggataccgaa caggcactcc gcgttttgga gagcccggca gtcaaggacg cgtgcctgca   840

cgcactcgag gctgcgagtg tcggcttgga agaccttgtt gaggcatggg gacgacgaga   900
```

```
aaaaatgaga tccgacaccc tcgacggcga cgacttaaca aggccaagca ccatcacaca    960

acatgaacaa gatgaccatg ttgatagagc tgccatcgat gccaagagtg atgcgagtgg   1020

cagtagcaat aagtctctca cgcccccaga gacagcccct acgacggaca ccctgtccga   1080

gacagctgtg ggggatatct cgtcagtcga cgtggattac tggactcgga gatgcgttcc   1140

cataatcggt agcctcttga aatcatgccg agtctactcg gaagcggaac gggaaacaca   1200

gctgcgcttc cttcaggaac atgtgctacc taatctaggt cctcgtccat cctcccccgg   1260

ctcgcagatc cagtccatgg ctacattcag cggctttcct ctccaaccca gcatcaacct   1320

gagcggctcc ggccaggcca aagtccgcta cacgtttgaa ccgctcgaca gcctgagtgg   1380

caccgaggtt gacccttttg cactggcgcc ggctcagcga gtgctcgaaa agctctccac   1440

ccttctcggc gtctggcctg gatggatcga cgctttgatc gctgcgtacc acccaaccag   1500

agaggaagtc gagcaattac acccgaatct gcacgagtac ctcagaggcg tcctcgtgag   1560

aacgacagga cgccaagatg tgcaggttcc tcccatgccg cgaatgtggg tgtgcttcgt   1620

tgcgcttgat ctggagggcg cctcacaggc actcaaggtt tattttgatc ccaagatcaa   1680

agaagccgtg actggtattc cttcctgcaa atacacttgt cagattctac ggacggttga   1740

taggtttggc aacgccaagg ccgtcgacat gcttgagcag tgagtcacgt ctgggagcac   1800

tatccaggtc cgaggtacta acaagatttt gtcaggttct tggcagagga gcacagcata   1860

ggcgctgtcg aactgattgc cattgattgc gtcccagaag aaatgcagcc atcggcgcgg   1920

atcaaggtct acgttcacac catgagcaac tcgtttcaga cagtacgcaa gtacatgaca   1980

atgggtggcc gctgcatgga tcctgcgacc ctcgagggtc tggaaaactt gcacgacgtg   2040

tggtactccc ttctcgggga aagtcaaggt attgtcaatg aagagtacag caagcccttg   2100

actggcttta gctcgatgca gcatcacttg tactttagct acgagatgac gcctggcaat   2160

gctgatcccg gcgtcaaagt ctacatacct gtgcaaagct acgcgccaga cgacaagacc   2220

atcgcgcaga actacgaggc aaattttcgg caactcaact ggccgtgggg cgaacccggc   2280

gtttacgaag cggtgataga gagtgctctg tacgtaatga caggcccttt gaccatatta   2340

cttactgaca acttggaatt tagtggacca gtaaagcaca gccgcgcaac gttcctccat   2400

ggaggatctt ctttcatctt ttccaaaggc cgaggagttt atcagtccat atatctagac   2460

cctccactgg aggaaggagg gaacattgct gtattcgagc accacgacga tcaggatact   2520

atagttgacc ttggcaatat gtag                                         2544
```

<210> 53
<211> 788
<212> PRT
<213> Neotyphodium lolii

<220>
<221> misc_feature
<222> (185)..(185)
<223> Xaa can be any naturally occurring amino acid

<400> 53

Met Lys Pro Thr Thr Arg Cys Pro Phe Asp Tyr Leu Val Ser Gln Cys
1   5   10   15

Gly Lys His His Phe Lys Thr Phe Val Gln Leu Leu Ser Pro Leu Leu
            20   25   30

Gln Asp Glu Asp Pro Asp Arg Tyr Ala Leu Ile Leu Asp Ile Met Asp
        35   40   45

Ala Val His Phe Ser Ala Ile Leu Ile Asp Asp Ile Ala Asn Gln Ser
    50   55   60

Ala Leu Arg Arg Asn Gln Pro Ala Ala His Val Val Phe Gly Glu Thr
65   70   75   80

Glu Thr Ala Thr Arg Ala Tyr Leu Val Leu Leu Arg Val Val Asn Arg
                85   90   95

Thr Met Arg Glu Asn Pro Val Leu Ala Gly Glu Leu Leu Asn Ser Leu
            100   105   110

Glu Glu Ile His Gln Gly Gln Asp Glu Ser Leu Val Trp Arg Arg Asp
        115   120   125

Gly Leu Glu Thr Phe Pro Val Ala Asp Asp Glu Arg Leu Ala Ala Tyr
    130   135   140

Val Arg Met Ser Arg Leu Lys Thr Gly Ser Leu Phe Val Leu Leu Gly
145   150   155   160

Arg Leu Leu Ala Asn Gly Gly Thr Glu Phe Asp Asp Leu Leu Val Arg
                165   170   175

Phe Gly Leu Tyr Ala Gln Leu Gln Xaa Asp Cys Lys Asn Ile Tyr Ser
            180   185   190

Pro Glu Tyr Ala Leu Asn Lys Gly Ser Val Ala Glu Asp Leu Arg Asn
            195   200   205

Gly Glu Leu Ser Tyr Pro Val Val Val Ala Leu Ile Glu Asn Lys Ala
    210   215   220

```
Glu Gly Ile Val Gly Glu Ala Leu Arg Thr Arg Ser Asp Gly Asp Thr
225             230             235             240

Glu Gln Ala Leu Arg Val Leu Glu Ser Pro Ala Val Lys Asp Ala Cys
            245             250             255

Leu His Ala Leu Glu Ala Ala Ser Val Gly Leu Glu Asp Leu Val Glu
            260             265             270

Ala Trp Gly Arg Arg Glu Lys Met Arg Ser Asp Thr Leu Asp Gly Asp
            275             280             285

Asp Leu Thr Arg Pro Ser Thr Ile Thr Gln His Glu Gln Asp Asp His
            290             295             300

Val Asp Arg Ala Ala Ile Asp Ala Lys Ser Asp Ala Ser Gly Ser Ser
305             310             315             320

Asn Lys Ser Leu Thr Pro Pro Glu Thr Ala Pro Thr Thr Asp Thr Leu
            325             330             335

Ser Glu Thr Ala Val Gly Asp Ile Ser Ser Val Asp Val Asp Tyr Trp
            340             345             350

Thr Arg Arg Cys Val Pro Ile Ile Gly Ser Leu Leu Lys Ser Cys Arg
            355             360             365

Val Tyr Ser Glu Ala Glu Arg Glu Thr Gln Leu Arg Phe Leu Gln Glu
            370             375             380

His Val Leu Pro Asn Leu Gly Pro Arg Pro Ser Ser Pro Gly Ser Gln
385             390             395             400

Ile Gln Ser Met Ala Thr Phe Ser Gly Phe Pro Leu Gln Pro Ser Ile
            405             410             415

Asn Leu Ser Gly Ser Gly Gln Ala Lys Val Arg Tyr Thr Phe Glu Pro
            420             425             430

Leu Asp Ser Leu Ser Gly Thr Glu Val Asp Pro Phe Ala Leu Ala Pro
            435             440             445

Ala Gln Arg Val Leu Glu Lys Leu Ser Thr Leu Leu Gly Val Trp Pro
            450             455             460

Gly Trp Ile Asp Ala Leu Ile Ala Ala Tyr His Pro Thr Arg Glu Glu
465             470             475             480
```

Page 57

```
Val Glu Gln Leu His Pro Asn Leu His Glu Tyr Leu Arg Gly Val Leu
            485             490             495

Val Arg Thr Thr Gly Arg Gln Asp Val Gln Val Pro Pro Met Pro Arg
            500             505             510

Met Trp Val Cys Phe Val Ala Leu Asp Leu Glu Gly Ala Ser Gln Ala
            515             520             525

Leu Lys Val Tyr Phe Asp Pro Lys Ile Lys Glu Ala Val Thr Gly Ile
        530             535             540

Pro Ser Cys Lys Tyr Thr Cys Gln Ile Leu Arg Thr Val Asp Arg Phe
545             550             555             560

Gly Asn Ala Lys Ala Val Asp Met Leu Glu Gln Phe Leu Ala Glu Glu
            565             570             575

His Ser Ile Gly Ala Val Glu Leu Ile Ala Ile Asp Cys Val Pro Glu
            580             585             590

Glu Met Gln Pro Ser Ala Arg Ile Lys Val Tyr Val His Thr Met Ser
        595             600             605

Asn Ser Phe Gln Thr Val Arg Lys Tyr Met Thr Met Gly Gly Arg Cys
610             615             620

Met Asp Pro Ala Thr Leu Glu Gly Leu Glu Asn Leu His Asp Val Trp
625             630             635             640

Tyr Ser Leu Leu Gly Glu Ser Gln Gly Ile Val Asn Glu Glu Tyr Ser
            645             650             655

Lys Pro Leu Thr Gly Phe Ser Ser Met Gln His His Leu Tyr Phe Ser
            660             665             670

Tyr Glu Met Thr Pro Gly Asn Ala Asp Pro Gly Val Lys Val Tyr Ile
            675             680             685

Pro Val Gln Ser Tyr Ala Pro Asp Asp Lys Thr Ile Ala Gln Asn Tyr
    690             695             700

Glu Ala Asn Phe Arg Gln Leu Asn Trp Pro Trp Gly Glu Pro Gly Val
705             710             715             720

Tyr Glu Ala Val Ile Glu Ser Ala Leu Gly Pro Val Lys His Ser Arg
            725             730             735
```

```
Ala Thr Phe Leu His Gly Gly Ser Ser Phe Ile Phe Ser Lys Gly Arg
            740                 745                 750


Gly Val Tyr Gln Ser Ile Tyr Leu Asp Pro Pro Leu Glu Glu Gly Gly
        755                 760                 765


Asn Ile Ala Val Phe Glu His His Asp Asp Gln Asp Thr Ile Val Asp
    770                 775                 780


Leu Gly Asn Met
785
```

```
<210>  54
<211>  742
<212>  DNA
<213>  Neotyphodium lolii

<400>  54
atggagcaag cgccgctcgc ttatcaggaa gttcaatggc tagctgaaac ttttgtcact    60

ttcatggggc ttggctggct tatcaattac gtcttgatga tctggcactc taggaggggt   120

gaaccgagca gcatggctct catacccctc tgcaacaaca tcgcctggga gctcgtatac   180

acgattatct atccgtctcc taacaaagtg gaacttgcgg ctttcatagc aggtgtcact   240

ttgaacttcc ttatcatgac ctctgcagcc cgttcggcaa gatccgagtg gagtcactca   300

cccacaatgg ctaagcatgc aggtttgatt atagtcgcag gaatattgat gtgcttcacc   360

ggacatgtag cattggcgat ggaaatagga cctgcgcttg cttactcatg gggagctgtc   420

atatgccaac tagctctaag cattggaggc gtgtgtcaat tgttgcagca gcatagtact   480

ggtgggacat catggaaact ttggtaagtg aataaatcaa ttacgtttct aatctatatt   540

gaatgtcata tcaggggtgg ctgacatgaa agttttcagg tcaagtcgat ttctaggctc   600

ttgttgtgcg gttggctttg cctttcttcg ctggagatac tggcccgagg cgtacggatg   660

gctggccagt ccccttatcc tctggagtct tgccacgttt cttgtggccg atttgacgta   720

cggggtttgt ctccttcttt ag                                           742
```

```
<210>  55
<211>  227
<212>  PRT
<213>  Neotyphodium lolii

<400>  55

Met Asp Gly Phe Ser Asn Met Glu Gln Ala Pro Leu Ala Tyr Gln Glu
1               5                   10                  15


Val Gln Trp Leu Ala Glu Thr Phe Val Thr Phe Met Gly Leu Gly Trp
```

```
                20                      25                      30

Leu Ile Asn Tyr Val Leu Met Ile Trp His Ser Arg Arg Gly Glu Pro
        35                      40                      45

Ser Ser Met Ala Leu Ile Pro Leu Cys Asn Asn Ile Ala Trp Glu Leu
        50                      55                      60

Val Tyr Thr Ile Ile Tyr Pro Ser Pro Asn Lys Val Glu Leu Ala Ala
65                      70                      75                      80

Phe Ile Ala Gly Val Thr Leu Asn Phe Leu Ile Met Thr Ser Ala Ala
                85                      90                      95

Arg Ser Ala Arg Ser Glu Trp Ser His Ser Pro Thr Met Ala Lys His
                100                     105                     110

Ala Gly Leu Ile Ile Val Ala Gly Ile Leu Met Cys Phe Thr Gly His
                115                     120                     125

Val Ala Leu Ala Met Glu Ile Gly Pro Ala Leu Ala Tyr Ser Trp Gly
        130                     135                     140

Ala Val Ile Cys Gln Leu Ala Leu Ser Ile Gly Gly Val Cys Gln Leu
145                     150                     155                     160

Leu Gln Gln His Ser Thr Gly Gly Thr Ser Trp Lys Leu Trp Ser Ser
                165                     170                     175

Arg Phe Leu Gly Ser Cys Cys Ala Val Gly Phe Ala Phe Leu Arg Trp
                180                     185                     190

Arg Tyr Trp Pro Glu Ala Tyr Gly Trp Leu Ala Ser Pro Leu Ile Leu
        195                     200                     205

Trp Ser Leu Ala Thr Phe Leu Val Ala Asp Leu Thr Tyr Gly Val Cys
210                     215                     220

Leu Leu Leu
225
```